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ENVIRONMENTAL STATEMENT CHAPTERS

Otterpool Quarry,
Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Non Technical Summary

SLR Ref 409.1376.00002

September 2009

solutions for today's environment

NON TECHNICAL SUMMARY

INTRODUCTION

Countrystyle Recycling Ltd. (Countrystyle) is applying for planning permission to develop an integrated waste management, treatment and recycling facility for commercial and industrial wastes together with the potential to provide capacity for the treatment and recovery of source separated municipal waste streams within East Kent. The proposed development will therefore provide a much needed facility for the recovery of recyclate, energy and compost from waste that would otherwise go to landfill and will help to ensure the diversion of the biodegradable element of waste away from landfill in accordance with European and National legislation.

The site is a former quarry, which has been used in the past for the storage and maintenance of vehicles and asphalt and concrete production. The site is currently not being used and is cleared of buildings but it is considered to be a brownfield, industrial type location because of its planning history and there being no restoration requirements.

Permission will be sought for the construction and subsequent operation of:

- A materials recycling facility (MRF) that will manage co-mingled recyclable materials from commercial and industrial producers. The enclosed plant will also have the capacity and capability to deal with possible future waste streams from municipal sources;
- An anaerobic digestion (AD) plant that will be in the form of an enclosed building housing waste reception and feedstock preparation areas with the digestion tank and gas utilisation plant along side;
- An external maturation pad for storing saleable product from the AD plant; and
- Associated office, mess and weighbridge facilities.

Site Description

Otterpool Quarry is located at national grid reference 611190E 136610N and is a redundant mineral and construction materials processing facility previously operated for the purpose of asphalt and readymix concrete production. The site is presently cleared of the previous buildings and uses but a number of concrete pads remain that used to support various processing equipment. Countrystyle has subsequently processed a limited quantity of mixed aggregate and historical process residues in order to tidy the site and establish volumes of surplus materials that can be used in the development of the site.

The site has an existing access on to the A20, Ashford Road, which forms the northern boundary of the site. A transport café is located on the other side of the A20 opposite the site access

The remainder of the site is surrounded by agricultural land with Barrow Hill Farm cottages located to the north west of the site on the other side of the A20. Otterpool Lane is located to the west of the site along with Otterpool Manor. A geological SSSI is located in fields to the south east of the site but would not be affected by the proposed development. Further to the south is the industrial estate and employment allocation known as Link Park.

The site itself, as a former quarry, is at a lower level than the surrounding farmland and has existing, established vegetation on its northern, eastern and southern boundaries. This will be retained and enhanced by the proposed development.

The site is not subject to any ecological, landscape or archaeological designations and is not located within a floodplain or a groundwater protection zone. The receipt of waste will take place between the following hours;

07.00 – 18.00 Monday to Friday

07.00 – 13.00 Saturdays

The site location is set out in Drawing OP/1 Site Location Plan.

This non technical summary accompanies the Environmental Statement which has been prepared as part of the planning process.

DESCRIPTION OF THE DEVELOPMENT

The proposed development will provide an integrated waste management, treatment and recycling facility for commercial and industrial wastes together with the potential to provide capacity for the treatment and recovery of source separated municipal waste streams within East Kent.

The proposed development, subject to this planning application, will therefore comprise:

- A materials recycling facility (measuring 93m by 30m by 12.5m high) that will manage co-mingled recyclable materials from commercial and industrial producers. The enclosed plant will also have the capacity and capability to deal with possible future waste streams from municipal sources. The MRF will also include an element of waste transfer capacity as it is recognised that some residual waste from both processes will require final disposal to landfill;
- An anaerobic digestion plant (measuring 60m by 47m by 12.5m high) that will be in the form of an enclosed building housing waste reception, feedstock preparation facilities with the digestion tank and gas utilisation plant alongside;
- A covered maturation pad (measuring 57m by 30m by 12.5m high) for storing saleable product from the AD plant; and
- Associated office, mess and weighbridge facilities.

The AD plant will consist of a waste reception hall where incoming waste would be deposited before being moved into the feedstock preparation area where the waste is turned in to a slurry. The slurry is then passed in to the single digestion tank where it is turned into biogas and compost. The biogas goes to the gas plant where it can be

used to generate electricity and the compost would be sold as a soil conditioner. The proposed plant will have the capacity to manage the proposed volume of 20,000 tonnes per annum (tpa). Details of the proposed plant are shown on Drawings OP/6 and 7. The waste reception, processing and digestion activities will all be managed within an enclosed building and only the maturation of the finished production will be undertaken outside because the material at this stage does not generate any significant odour release.

Dust and Odour Control (Anaerobic Digestion)

The following information explains how the proposed AD system at Otterpool will manage this risk in line with the numerous facilities operating in a small number of UK locations together with a much larger number of mainland European operations.

It is intended to install the KOMPOGAS Process, (one of Europe's leading AD suppliers), for the organic waste treatment system at Otterpool. This choice has been made following a technical review by SLR Consulting of several AD technology providers currently available to the market. This type of process based on a horizontal digester and all storage of waste inside the building was chosen based on the evaluation of different potential feedstocks planned for this site.

The anaerobic digestion plant is designed to treat organic waste streams, for example garden and kitchen waste. Organic waste is always collected separately and will not come into contact with other waste streams using the MRF facility.

Tipping of waste from vehicles will not be allowed until they have entered the building and doors in the reception hall are closed. Materials once tipped within the AD tipping hall are processed by shredding and screening before transported into the digester feed hopper. Any materials found to be outside of the operating parameters of the facility or in breach of permitted waste types (specified by the regulatory permit) will be stored within an allocated area until onward transportation can be arranged. At all times, such materials will be held within the enclosed building.

Organic material from the feed hopper is pumped to the fermenter in a fully automated system. Digestion of waste takes place in a fully sealed and insulated tank. Bacteria use organic material as their food source, thereby removing those components with the potential for unpleasant odour formation and releasing biogas. Biogas, a high value product, is collected from the headroom of the digester and used in a gas engine for power production.

The fermentation residue is dewatered into a cake and liquid phase. The liquid phase is partially recycled and any surplus liquid is stored in covered tanks and used as liquid fertilizer. The digestate cake is laid out in composting rows inside a different part of the enclosed building. Active aeration starts a conventional composting process which leads to further stabilisation of remaining organic material.

An overview of the KOMPOGAS process is shown in below.

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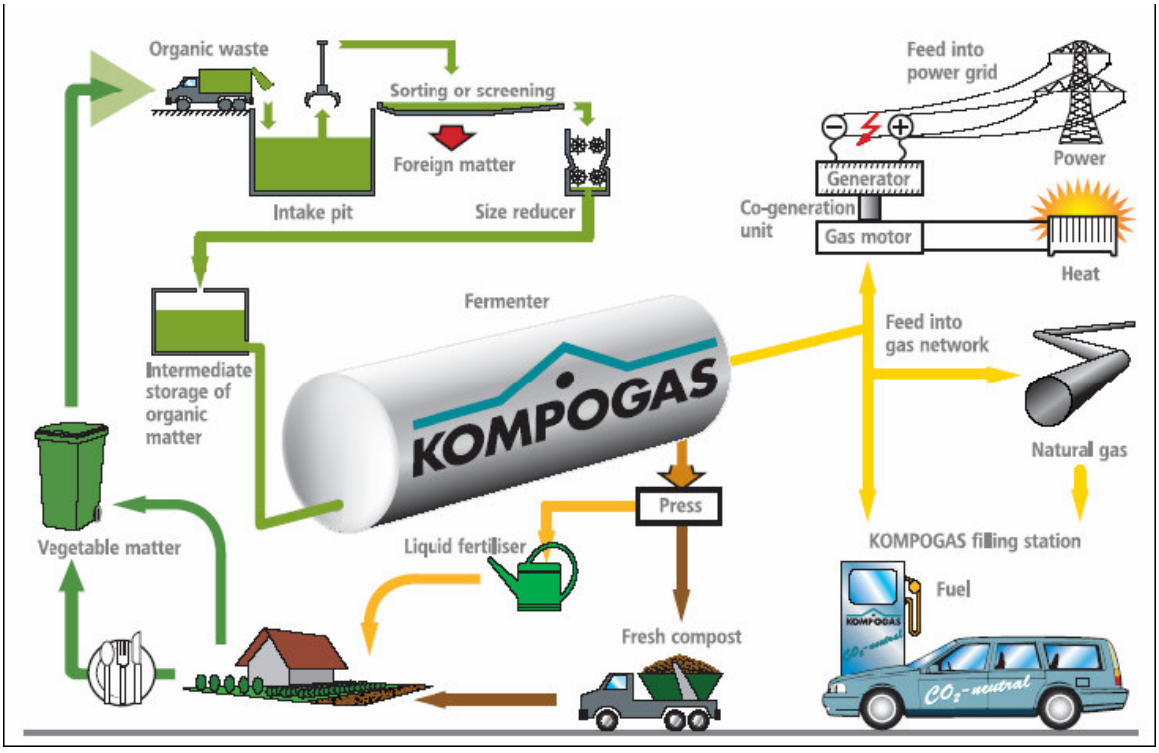

Ventilation

As the AD plant is an enclosed waste treatment facility, a ventilation system will be required to manage odour, operator health and safety, dust and particulate emissions.

The Kompogas ventilation system is designed to provide frequent exchanges of air in enclosed buildings and to maintain negative air pressure within enclosed buildings (i.e. the air pressure inside the building is lower than outside) so as to prevent air emissions to the atmosphere from doors etc. The ventilation system will include the standard ducting and fans leading to a biofilter for odour removal.

All air from the reception hall is directly diverted to the biofilter system. Compounds causing odour are used by microbes in the biofilter as food source. Microbes reduce these compounds in the presence of oxygen to carbon dioxide and water and as such remove potential odour from released air. The biofilter, always kept wet, works in addition as an efficient dust treatment system for airborne particles from the reception hall.

During anaerobic digestion, proteins in the organic material have been degraded and thereby some ammonia has been released into the liquor. During composting a part of ammonia will be evaporated. Therefore the composting area is kept under negative pressure and all air is treated in the biofilter before released into the environment. The

slightly acid conditions in the biofilter are favourable for removal of ammonia, allowing for high treatment efficiency.

After 2 to 3 weeks aeration of the digestate cake, the material has changed to a well stabilised compost. Bacterial activity is low and heat release gradually slows down to leave a mildly warm compost material. At this stage the compost will be transported for further maturation in the enclosed maturation hall.

Final maturation for another 2 to 3 weeks is a process dominated by humus formation, giving the material the typical compost properties. The process takes place without further aeration. The final product has the same properties as compost from conventional treatment processes. No odour formation is expected from the storage of mature compost. Refinement of the material takes place inside the maturation building.

Kompogas recommend that an AD plant receiving 20,000 tonnes of waste per annum has a Receiving Hall area including Conditioning and Intermediate Storage Area in the order of 900m^2.

The proposed dimensions of the AD buildings at Otterpool are in line with those recommended by Kompogas. The ventilation and odour control systems set out in the Kompogas report would be used at Otterpool, consequently, odour should not be a problem.

Due to the internalisation of all waste treatment, both in the AD and MRF buildings, it is not envisaged that air borne dust should be created by the operating procedures at the site and that any dust created within the buildings will be managed as part of the daily housekeeping regime.

Externally, further design aspects including the hard-standing areas that surround the buildings, will limit the creation of air borne dust from traffic movements associated with the operations.

In the event, however, that any dust is created and becomes visibly airborne, then the operator will use adequate dust suppression measures to dampen the yard areas and prevent this escaping the operational site. This will be controlled by standard measures that will include a tractor mounted water bowser that will utilise rain water collected from the roof and site drainage systems.

It is proposed that the AD plant will deal with the following waste types:

- Source separated organic waste and pre-consumer organic waste;
- Post consumer separated organic waste from commercial and industrial producers;
- Source separated green waste from municipal sources within East Kent; and
- Source separated mixed organic waste from municipal sources.

Materials Recycling Facility

The MRF will have a capacity to deal with 75,000 tpa and all waste reception and processing activities will be entirely enclosed within the proposed building. Any

external storage of material recovered from the recycling process will be limited to items such as baled metals and will not include paper rich materials.

The MRF will manage the following waste types:

- Source segregated commercial and industrial waste, which from the 1st October 2007 requires mandatory pre-treatment in accordance with the Landfill (England and Wales) Regulations 2002;
- Source separated co-mingled commercial waste from municipal sources; and
- The transfer of non-recyclable residual waste that cannot be recovered by the above two processes.

The proposed development would use the existing site access on to the A20 but this would improved and widened within the site to provide adequate sight lines and allow the free movement of HGVs into and out of the site. Daily vehicles movements based on a 95,000 tpa throughput are estimated to be in the region of 135 (in and out) a day. Hours of operation for the receipt of waste will be 0700 to 1800 hours Monday to Friday and 0700 to 1300 hours on Saturdays, with no operations on Sundays or Public Holidays. However the AD process is by its nature a 24 hour process so this plant would have to operate on a continuous basis.

The proposed development will employ an estimated 25 full time equivalents.

Existing screening vegetation on the site boundary would be retained and managed and a 2m strip of additional planting would be created along the western boundary of the site, see Drawing OP/4.

Alternative site Assessment

A review of 17 potential alternative sites was carried out to determine if other sites within East Kent would be more environmentally acceptable for this development. The site selection came about through discussions with District Councils and local land agents.

Many of the sites were Greenfield, which goes against the policies of PPS10 and the Development Plan which support brownfield sites or previously used sites for waste management developments. Many sites were also too small and/or provided a standard industrial building which may have been suitable for a MRF but not for an AD Facility, which has to be purpose built,

The top scoring sites were Axiom at Orbital Park and Cheriton Parc which scored 12 points out of a possible 19. Otterpool Quarry scored 10 points, as did Waterbrook (Sevington) and Eureka Business Park in Ashford. All the other sites scored less than 10.

Although Orbital Park and Cheriton Parc scored higher than Otterpool Quarry, the available plots at both are smaller than 2ha and Cheriton Parc is limited to B1 use thus unsuitable for the proposed use. Eureka Business Park is also limited to B1 use and Waterbrook is not yet on the market.

The conclusion has therefore been reached that the most appropriate site of those considered as part of this alternative site assessment, is Otterpool Quarry.

Need

A report produced for WRAP (Waste and Resources Action) entitled 'Dealing with Food Waste in the UK' states that food waste is one of the largest single fractions of the UK waste stream.

Although waste food makes up approximately 18% of UK household waste (around 216kg per household per annum), at present, only 2% of the food waste produced in the UK is collected separately for composting or anaerobic digestion.

Home composting is on the increase and has the potential to reduce the amount of waste in the food stream by up to 10%, however, the majority of food waste will still go to landfill.

Policy 8 of the Kent Joint Municipal Waste Management Strategy (2007) seeks a pooled recycling and composting target of 40% for recycling and composting for 2012/2013. Policy 12 states that Kent Waste Partnership will work to secure composting capacity, to enable the Authorities in Kent to provide an efficient and cost effective service.

The Kent Waste Strategy seeks to compost more waste and if permitted, the AD facility could make a significant contribution to the 40% recycling and composting target.

In summary, the quantity of food waste within the UK waste stream is likely to remain significant for the foreseeable future thus the need for alternatives treatment methods to landfill is clear. AD has strong backing in the Waste Strategy 2007, however, there is an acute lack of AD facilities in the UK at present. AD offers a facility to generate 100% renewable energy from biodegradable waste and research undertaken by Friends of the Earth confirms that it is the most sustainable way to treat food waste in the UK.

SUMMARY OF ENVIRONMENTAL EFFECTS

As the proposed development is Schedule 2 Development, a number of technical assessments were undertaken to assess the main likely environmental effects and describe measures to avoid, reduce or remedy any significant adverse environmental effects.

The Technical Assessments are presented in full in Volume 2, however, a short summary of the findings is set out below.

Air Quality

An Air Quality assessment was undertaken regarding the impacts associated with the proposed development.

The Assessment identified the following as sources with the potential to impact on air quality:

- Emissions from vehicle movements on local link roads associated with construction and operation;
- Deposited dust resulting from construction and operational activities;
- Potential odour generating sources during operation associated with waste received at the MRF/AD plant; and

- Combustion emissions from gas plant associated with the AD plant.

The assessment was undertaken in a phased manner, whereby an initial screening was undertaken to gauge the potential significance of any impact and further (more detailed) assessment undertaken if necessary. Mitigation measures were also described. The assessments undertaken indicated that the mitigated scenario would not lead to a significant risk of impact and it was not considered that any additional air quality monitoring was statutorily required to assess the potential impacts of this proposal.

Landscape and Visual Impact

In response to questions from KCCs Landscape Officer, SLR produced a Landscape Design and Visual Impact Document (May 2008). The Landscape Officer concluded that "*we do not consider that the proposals would have any significant impact on views from the Kent Downs AONB, or impact significantly on its landscape quality because of the distance of the site from the AONB, intervening landform, vegetation and development from any available views'.*"

Traffic and Transport

The traffic and transport impacts of the proposed development have been considered and are summarised below:

The development would receive wastes from East Kent and would generate approximately 152 two-way HGV movements per day, averaging around 16 movements per hour. The existing access junction would be upgraded as part of the proposals.

The application site is well located in terms of access to the strategic road network and all HGV traffic, with the exception of very local trips, would be routed east from the site access to access the M20 at Junction 11. The route passes minimal development and avoids the villages of Sellindge and Barrowhill.

The operation of the proposed access junction has been assessed. It has been demonstrated that the junction would operate with significant spare capacity in the future, with no queuing or driver delay expected. No capacity issues are anticipated on the surrounding highway network.

The A20 has a high proportion of HGV use and is an established freight route for vehicles travelling between the M20 and Lympne Industrial Estate. The development proposals would generate a moderate increase in HGV numbers on this link, however no significant environmental impact has been concluded.

An assessment of personal injury road traffic accidents identified no accidents within the immediate vicinity of the site access junction during the previous five years. An insignificant impact upon road safety has been concluded.

Overall, it is considered that the development proposals are acceptable in traffic and transport terms.

Noise

A noise assessment was carried out in accordance with EIA good practice guide, the EIA Regulations and British standard guidance. T

Baseline noise surveys were carried out on 10th and 11th October and 25th November 2007 to establish the existing noise climate at four of the nearest noise-sensitive receptors to the site during weekday and weekend periods. Noise measurements were undertaken at the following positions which were considered representative of the residential noise-sensitive receptors closest to the site:

- Position 1 on land to the south of Upper Otterpool, to the south of the site;
- Position 2 Otterpool Manor, to the west of the site;
- Position 3 Barrow Hill Farm Cottages, to the north-west of the site; and
- Position 4 Mink Farm to the north-east of the site.

The assessment of ambient noise levels showed that a moderate impact was predicted at Upper Otterpool during the weekday daytime period.
It was recommended that, in order to reduce this impact to slight and barely, the MRF building should be designed to achieve attenuation of 35dB.
The BS4142 assessment of noise from the fixed plant showed that the weekday and weekend operations will be unlikely to lead to noise complaints from local residents.
The ambient noise assessment has shown that, with the recommended mitigation measures, the impact on ambient noise levels will be at worst, slight and barely perceptible.

Geology, Hydrology and Hydrogeology

There are no surface water features within the proposed development area or along its boundaries. The Environment Agency has indicated[1] that the site falls within Flood Zone 1, which represents an annual probability of less than 0.1% of a flood occurring. The Environment Agency has also indicated that their records do not give any indication of flooding from a ‘main river’ having affected the site in the past.

Although the site is only in a Flood Zone 1, owing to the size of the development being greater than 1 hectare, in accordance with PPS25 – Development and Flood Risk, a flood risk assessment has been prepared. The flood risk assessment, together with the proposed surface water management scheme shows there is no increased or residual flood risk from the proposed development.

Potential Impacts on Geology

The proposed development does not include any change to the landform, and hence no impact on the site geology is involved. The proposed development is not considered likely to have any impact on the adjacent geological SSSI, as the proposed development is at a lower elevation than the SSSI, and is separated by a 2-3m rockface that would not be affected by the development. Hence there is no likelihood of runoff from the proposed development reaching the SSSI and affecting the geology in any way.

Potential Impacts on Groundwater and surface water

Given the hydrogeological setting, it is considered that the proposed development has the potential to impact on groundwater and surfacewater in terms of both the quality and the flow regime.

The groundwater and surface water regimes at the proposed development site have been assessed with reference to information held by the British Geological Survey, the Environment Agency, Local Authorities and others. The development site is located on the Hythe Formation, which is considered to be a Major Aquifer. These deposits overlie the low permeability Atherfield Clay and Wealden Clays.

A single private water supply is located 1.5km of the site; however, this is likely to draw water from the overlying Folkestone Formation rather than the Hythe Formation. The Hydrogeological Map indicates that groundwater flows towards the north from the outcrop area towards the East Stour River.

The potential impacts of the proposed development upon the hydrogeological and hydrological environments have been identified and assessed, and where appropriate, mitigation measures have been accommodated into the design of the development. It is recommended that all aspects of the construction and operation of the site are in accordance with best practice guidance. Overall, it is concluded that, with respect to geology, groundwater and surface water, there are no significant residual impacts of the development after consideration of the identified mitigation measures.

Ecology

The local planning authority and Natural England office were consulted at the screening stage on the need or otherwise for an Ecological Impact Assessment (EcIA). During this consultation period, Natural England advised that in this case a full EcIA would not be necessary, however they did advise that:

> *'appropriate detailed surveys which should include as a minimum a Phase 1 Habitat survey are included as part of the planning application and that an appropriate mitigation strategy is developed and implemented with regards to protected species should these be present which should include an evaluation of:*
>
> - *the impacts on the protected species concerned;*
> - *the proposed habitat reinstatement post construction if there is to be any loss of natural habitat that should aim to bring about a net*

gain for biodiversity in line with Planning Policy Statement 9: Biodiversity and Geological Conservation.

The surveys should be carried out by experienced and appropriately trained/licensed persons. Information about the potential impacts of the proposal on habitats and protected species and, where necessary, details of mitigation should be submitted before the application is determined.'

In order to satisfy the requirements of Natural England, particularly with respect to protected species, and provide sufficient ecological information in support of the current application a desk top study and field work were undertaken.

Data – Desk Study

Information on statutory wildlife sites within 2km of the application area has been obtained from published sources. Information on non-statutory sites and the presence of protected species near the site has also been sought through consultation with Kent and Medway Biological Records Centre (KMBRC), and the National Biodiversity Network (NBN) gateway[2].

Collection of Baseline Data – Field work

A baseline ecological survey of the site was conducted by an Ecologist from SLR and comprised of an Extended Phase 1 Habitat survey with initial appraisal of habitats within the site and a 30m annulus for protected species including bats, reptiles and badger.

The Extended Phase 1 Habitat survey comprised an assessment of the ecological value and distribution of habitat within the site as a whole and aimed to identify and provide further information, through the use of Target Notes on habitat features of particular value to different plant and animal groups.

Given the habitats and species present on the site and the extent of the proposed development, no further survey work was considered to be required as long as there are no works scheduled to take place within 20 metres of the stand-off of the badger sett in the south-eastern corner of the site. If for any reason works need to be undertaken within the standoff then further survey work will be required.

The assessment of impacts identified that the proposed development would result in the potential disturbance of the badgers resident in a sett in the south eastern corner of the site, but that the level of disturbance was not significant at a local level. No other residual impacts associated with the proposed development were anticipated.

Cumulative Effects

Otterpool Quarry is a redundant quarry and industrial site. No significant adverse cumulative effects have been identified as a result of the proposed development and positive impacts in relation to sustainable waste management and employment have been identified.

[2] www.searchnbn.net

CONCLUSIONS

A need for facilities to manage green waste and food waste in East Kent has been identified in the Development Plan and Anaerobic Digestion is considered to be the optimum technology to meet this need.

The need for waste management facilities has been demonstrated through the South East plan which sets targets for the recycling and composting of waste. If Kent is to meet these targets, AD and MRF facilities as proposed in this application are going to be critical.

The Environmental Statement does not identify any significant adverse effects on the environment as a result of the proposed development.

Otterpool Quarry, Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Design and Access Statement

SLR Ref 409.1376.00002

COUNTRYstyle RECYCLING

WASTE MANAGEMENT SOLUTIONS

July 2009

solutions for today's environment

Design and Access Statement

Introduction

1.1 Details of the proposed development are set out in previous sections of this document and the associated drawings. This section presents details of the design and access arrangements of the proposed development and is produced to comply with DCLG Circular 01/2006 and takes account of the CABE best practice guidelines. Drawings OP/5 to OP/9 show the elevations of the proposed buildings.

Use

1.2 The proposed development is for the construction and subsequent operation of materials recycling facility and an anaerobic digestion plant. The proposed development would consist of:

- A materials recycling facility (measuring 93m by 30m by 12.5m high) that will manage co-mingled recyclable materials from commercial and industrial producers. The enclosed plant will also have the capacity and capability to deal with possible future waste streams from municipal sources. The MRF will also include an element of waste transfer capacity as it is recognised that some residual waste from both processes will require final disposal to landfill;

- An anaerobic digestion plant (measuring 60m by 47m by 12.5m high) that will be in the form of an enclosed building housing waste reception, feedstock preparation facilities with the digestion tank and gas utilisation plant alongside;

- An external maturation pad (measuring 48m by 59m at its widest and longest points) for storing saleable product from the AD plant; and

- Associated office, mess and weighbridge facilities.

1.3 The proposed site, whilst currently vacant, has previously been used for a variety of industrial type developments including concrete and coated roadstone production and storage type uses. The proposed buildings and plant will therefore be of a similar nature to previous uses of the site.

Amount

1.4 It is considered that the amount of development is appropriate to the site and its location. The proposed buildings and would create a modern, efficient waste management facility and would not have any significant detrimental impact on the amenity of the surrounding area.

1.5 The amount of waste handled at the site would be in the region of 95,000 tpa.

Layout

1.6 The proposed development would be located within the boundary of the existing site and would take place within areas of the site which have already been previously developed. The site would use the existing site access which would lead in to the site and round to the proposed MRF. The proposed AD plant would be located to the back of the site.

1.7 Existing perimeter vegetation would be retained by the proposed development and a new 4m high bund with new planting on the western boundary of the site would be constructed to enclose the proposed development.

Scale

1.8 The new buildings and plant would be of similar scale to the previous developments on the site and elevations are shown on Drawings OP5 to OP/9.

Landscaping

1.9 The landscaping proposals associated with this development include the development of a 4m high bund along side the western boundary of the site where the maturation pad is located. The proposed bund would be planted with native tree and shrub species and would assist in screening the site from this direction. Existing planting around the northern, eastern and southern boundaries of the site would be retained as part of the proposed development.

Appearance

1.10 The proposed MRF would be constructed of steel frame and steel profile cladding coloured heritage green with roller shutter doors. The AD plant would also be of a steel frame construction but the lower parts of the building would be constructed in concrete with the other parts using steel profile cladding, again coloured heritage green. This would be similar to the colour of the existing buildings and would blend in with surrounding vegetation. The proposed digestion tank and gas utilisation plant also have a functional appearance reflecting the nature of the development and would incorporate heritage green colouring wherever practicable. The proposed appearance of the development is considered appropriate to the industrial type site on which it is located.

Access

1.11 The proposed development would improve and use an existing site access which is directly on to the main route network. The proposed development would not have a significant impact on the surrounding route network and further details are provided in the transport assessment which accompanies this planning application.

1.12 Office and mess facilities would incorporate disabled access and welfare facilities as required by legislation but the proposed development would not be open to the general public.

Benefits of the Development

1.13 The benefits of the proposed development are considered to be as follows:

- It will provide modern, purpose designed buildings for the recycling and recovery of waste materials and energy to move the management of waste up the hierarchy in accordance with national, regional and local waste planning policy;

- It will meet an identified need for new recycling and recovery capacity in east Kent which will help to ensure that Kent can demonstrate that they are providing effective recycling and recovery capacity that will contribute to the achievement of their landfill diversion targets for 2010 and onwards;

- The proposed site is a brownfield, industrial type location with an existing access on to the main route network serving east Kent and is in accordance with the policies of the existing Kent Waste Local Plan and the emerging strategy of the new Waste Development Framework;

- Locating recycling, recovery and transfer facilities together will mean that the waste treatment process can be managed on a single site;

- The existing site is well separated from local residents and has excellent transport links and the assessments that accompany this application do not identify any unacceptable adverse effects on the community, environment or transport links as a result of this development.

SLR

Otterpool Quarry
Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Environmental Statement – Introduction and Description of Development

COUNTRYstyle RECYCLING

WASTE MANAGEMENT SOLUTIONS

July 2009

SLR Ref 409.1376.00002

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INTRODUCTION AND DESCRIPTION OF DEVELOPMENT 1

INTRODUCTION

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The site itself, as a former quarry, is at a lower level than the surrounding farmland and has existing, established vegetation on its northern, eastern and southern boundaries. This will be retained and enhanced by the proposed development.

The site is not subject to any ecological, landscape or archaeological designations and is not located within a floodplain or a groundwater protection zone.

Planning History

The planning history of the site dates back to 1947 when permission was granted for the storage and maintenance of vehicles and associated workshops (SH/75/794). Further planning permissions were subsequently granted by Shepway District Council in 1972 (buildings); 1986 (ready mixed concrete batching plant); 1988 (portable coating plant); and 1989 (steel clad workshops).

This history of industrial development granted by the District Council and the lack of any restoration requirements confirms that this is an industrial, brownfield site, which is considered to be a suitable location for waste management development.

Description of the Development

The proposed development will provide an integrated waste management, treatment and recycling facility for commercial and industrial wastes together with the potential to provide capacity for the treatment and recovery of source separated municipal waste streams within East Kent.

The proposed development, subject to this planning application, will therefore comprise:

- A materials recycling facility (measuring 93m by 30m by 12.5m high) that will manage co-mingled recyclable materials from commercial and industrial producers. The enclosed plant will also have the capacity and capability to deal with possible future waste streams from municipal sources. The MRF will also include an element of waste transfer capacity as it is recognised that some residual waste from both processes will require final disposal to landfill;

- An anaerobic digestion plant (measuring 60m by 47m by 12.5m high) that will be in the form of an enclosed building housing waste reception, feedstock preparation facilities with the digestion tank and gas utilisation plant alongside;

- An external, covered, maturation pad (measuring 48m by 59m at its widest and longest points) for storing saleable product from the AD plant; and

- Associated office, mess and weighbridge facilities.

The AD plant will consist of a waste reception hall where incoming waste would be deposited before being moved into the feedstock preparation area where the waste is turned in to a slurry. The slurry is then passed in to the single digestion tank where it is turned into biogas and compost. The biogas goes to the gas plant where it can be used to generate electricity and the compost would be sold as a soil conditioner. The proposed plant will have the capacity to manage the proposed volume of 20,000 tonnes per annum (tpa). Details of the proposed plant are shown on Drawings OP/6 and OP7. The waste reception, processing and digestion activities will all be managed within an enclosed building and only the maturation of the finished production will be undertaken outside because the material at this stage does not generate any significant odour release.

It is proposed that the AD plant will deal with the following waste types:

- Source separated organic waste and pre-consumer organic waste;
- Post consumer separated organic waste from commercial and industrial producers;
- Source separated green waste from municipal sources within East Kent; and
- Source separated mixed organic waste from municipal sources.

Dust and Odour Control (Anaerobic Digestion)

It is intended to install the KOMPOGAS Process, (one of Europe's leading AD suppliers), for the organic waste treatment system at Otterpool. This choice has been made following a technical review by SLR Consulting of several AD technology providers currently available to the market. This type of process based on a horizontal digester and all storage of waste inside the building was chosen based on the evaluation of different potential feedstocks planned for this site.

The anaerobic digestion plant is designed to treat organic waste streams, for example garden and kitchen waste. Organic waste is always collected separately and will not come into contact with other waste streams using the MRF facility.

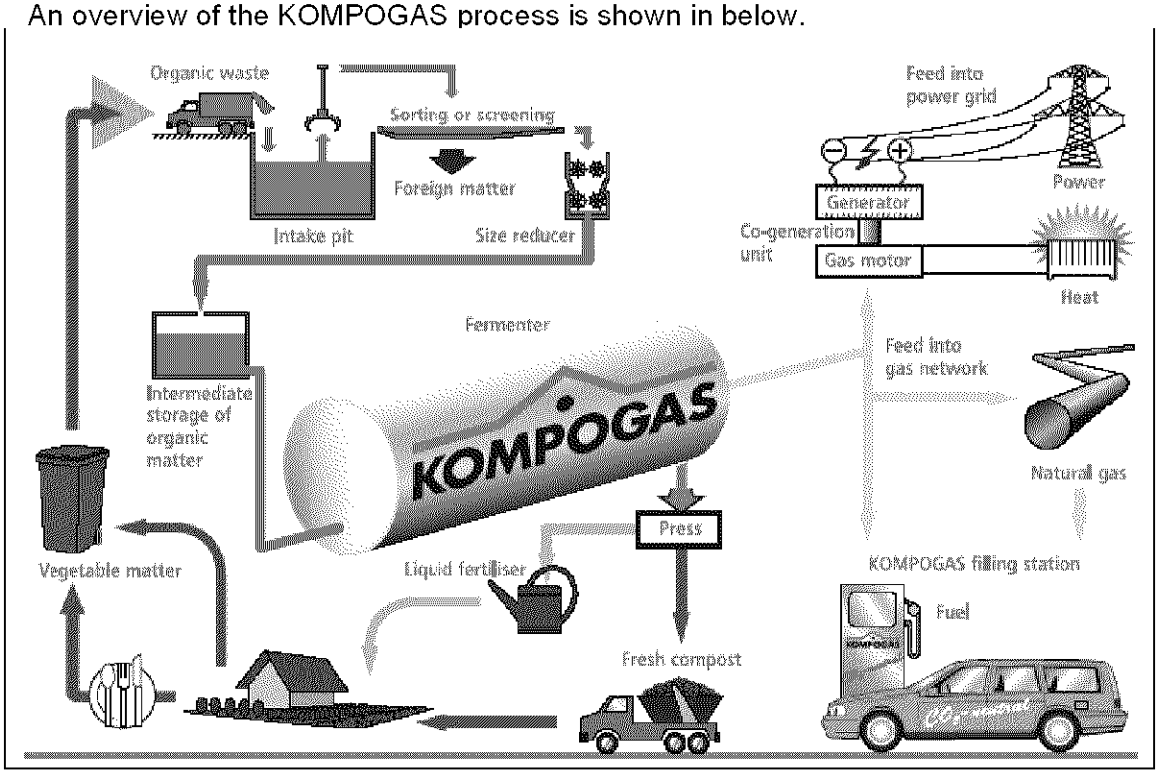
Tipping of waste from vehicles will not be allowed until they have entered the building and the doors in the reception hall are closed. Materials tipped within the AD tipping hall are processed by shredding and screening before being transported into the digester feed hopper. Any materials found to be outside of the operating parameters of the facility or in breach of permitted waste types (specified by the regulatory permit) will be stored within an allocated area until onward transportation can be arranged. At all times, such materials will be held within the enclosed building.

Organic material from the feed hopper is pumped to the fermenter in a fully automated system. Digestion of waste takes place in a fully sealed and insulated tank. Bacteria

use organic material as their food source, thereby removing those components with the potential for unpleasant odour formation and releasing biogas. Biogas, a high value product, is collected from the headroom of the digester and used in a gas engine for power production.

The fermentation residue is dewatered into a cake and liquid phase. The liquid phase is partially recycled and any surplus liquid is stored in covered tanks and used as liquid fertilizer. The digestate cake is laid out in composting rows inside a different part of the enclosed building. Active aeration starts a conventional composting process which leads to further stabilisation of remaining organic material.

An overview of the KOMPOGAS process is shown in below.



Ventilation

As the AD plant is an enclosed waste treatment facility, a ventilation system will be required to manage odour, operator health and safety, dust and particulate emissions.

The Kompogas ventilation system is designed to provide frequent exchanges of air in enclosed buildings and to maintain negative air pressure within enclosed buildings (i.e. the air pressure inside the building is lower than outside) so as to prevent air emissions to the atmosphere from doors etc. The ventilation system will include the standard ducting and fans leading to a biofilter for odour removal.

All air from the reception hall is directly diverted to the biofilter system. Compounds causing odour are used by microbes in the biofilter as food source. Microbes reduce these compounds in the presence of oxygen to carbon dioxide and water and as such remove potential odour from released air. The biofilter, always kept wet, works in addition as an efficient dust treatment system for airborne particles from the reception hall.

During anaerobic digestion, proteins in the organic material have been degraded and thereby some ammonia has been released into the liquor. During composting a part of ammonia will be evaporated. Therefore the composting area is kept under negative pressure and all air is treated in the biofilter before released into the environment. The slightly acid conditions in the biofilter are favourable for removal of ammonia, allowing for high treatment efficiency.

After 2 to 3 weeks aeration of the digestate cake, the material has changed to a well stabilised compost. Bacterial activity is low and heat release gradually slows down to leave a mildly warm compost material. At this stage the compost will be transported for further maturation in the enclosed maturation hall.

Final maturation for another 2 to 3 weeks is a process dominated by humus formation, giving the material the typical compost properties. The process takes place without further aeration. The final product has the same properties as compost from conventional treatment processes. No odour formation is expected from the storage of mature compost. Refinement of the material takes place inside the maturation building.

Kompogas recommend that an AD plant receiving 20,000 tonnes of waste per annum has a Receiving Hall area including Conditioning and Intermediate Storage Area in the order of 900m^2.

The proposed dimensions of the AD buildings at Otterpool are in line with those recommended by Kompogas. The ventilation and odour control systems set out in the Kompogas report would be used at Otterpool, consequently, odour should not be a problem.

Dust

Due to the internalisation of all waste treatment, both in the AD and MRF buildings, it is not envisaged that air borne dust should be created by the operating procedures at the site and that any dust created within the buildings will be managed as part of the daily housekeeping regime.

Externally, further design aspects including the hard-standing areas that surround the buildings, will limit the creation of air borne dust from traffic movements associated with the operations.

In the event, however, that any dust is created and becomes visibly airborne, then the operator will use adequate dust suppression measures to dampen the yard areas and prevent this escaping the operational site. This will be controlled by standard

measures that will include a tractor mounted water bowser that will utilise rain water collected from the roof and site drainage systems.

Materials Recycling Facility

The MRF will have a capacity to deal with 75,000 tpa and all waste reception and processing activities will be entirely enclosed within the proposed building. Any external storage of material recovered from the recycling process will be limited to items such as baled metals and will not include paper rich materials.

The MRF will manage the following waste types:

- Source segregated commercial and industrial waste, which from the 1st October 2007 requires mandatory pre-treatment in accordance with the Landfill (England and Wales) Regulations 2002;
- Source separated co-mingled commercial waste from municipal sources; and
- The transfer of non-recyclable residual waste that cannot be recovered by the above two processes.

The proposed development would use the existing site access on to the A20 but this would be improved and widened within the site to provide adequate sight lines and allow the free movement of HGVs into and out of the site. Daily vehicles movements based on a 95,000 tpa throughput are estimated to be in the region of 135 (in and out) a day.

Hours of operation

Hours of operation for the receipt of waste will be 0700 to 1800 hours Monday to Friday and 0700 to 1300 hours on Saturdays, with no operations on Sundays or Public Holidays. However the AD process is by its nature a 24 hour process so this plant would have to operate on a continuous basis.

SCOPING EXERCISE

On the 27th September 2007 a Screening and Scoping Opinion request was sent from SLR Consulting to Kent County Council (KCC). On the 26th October 2007, KCC issued their adopted Screening Opinion which stated that they did not consider the proposal to be EIA development.

A planning application was duly made and received by KCC in December 2007. In January 2009, KCC wrote to SLR stating that they now believed the proposals did constitute EIA development and issued a revised Screening Opinion to that effect. SLR appealed the revised Screening Opinion to the Secretary of State (SoS). The

SoS determined on the 29th April 2009 that they considered the development to be EIA development.

Rather than withdraw the planning application, SLR have reviewed the existing planning application documents and Technical Assessments to ensure that they meet the requirements of the ES. In the event it was found that the Technical Assessments already met the requirements of ES chapters i.e. they assessed the main environmental impacts and described measures to avoid, reduce or remedy any significant adverse effects.

It should be clarified that there is no change to the proposed development i.e. the location, nature and scale remain identical to the submitted application.

REQUIREMENTS FOR AN ENVIRONMENTAL IMPACT ASSESSMENT

The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, as amended by the Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2000, (hereafter jointly referred to as the EIA Regulations) implement Council Directive No 85/337/EEC (as amended) on the assessment of the potential effects of specified development proposals on the environment. The Regulations came into force on 14th March 1999. Prior to the grant of a planning permission in respect of any proposal to which the EIA Regulations apply, an Environmental Impact Assessment (EIA) is required. Responsibility for compiling information regarding environmental effects lies with the developer, and the information is presented as an 'Environmental Statement'.

The EIA Regulations specify the types of development for which an EIA is mandatory (Schedule 1 Projects) and categories of development where an EIA may be required (Schedule 2 Projects). In connection with the proposed development, it is considered to be a Schedule 2 development as specified in Category 10 of the Regulations.

Accordingly Countrystyle Recycling Ltd has commissioned SLR Consulting Limited to prepare an Environmental Statement to accompany the already submitted planning application.

EIA is a structured and systematic process for predicting and evaluating the likely impact on the environment, of specific projects. EIA is defined as 'the process whereby information about the environmental effects of a project is collected, assessed and taken into account in reaching a decision on whether the project should go ahead or not" (DETR 2000).

This ES is intended to provide the local planning authority (i.e. Kent County Council) with sufficient information to determine the planning application having due regard to the protection of local amenity and the environment as a whole.

APPROACH TO ASSESSMENT

The EIA process has considered both the construction and operational impacts of the proposed development. As required by the EIA Regulations, the assessment of impacts has been carried out according to its type (beneficial or adverse) and duration (temporary or permanent). Cumulative impacts have also been considered. These are described in the relevant ES chapters.

The criteria used for assessing the degree of significance are based on the relevant technical guidance from the appropriate professional institute and/or industry good practice. Where well-documented significance criteria are not available, generic significance criteria (Table 1/1) have been used based on the requirements of the EIA Regulations. They have been developed following research and based on SLR's expertise and experience in carrying out EIAs.

Table 1/1 Generic Significance Criteria

Significance	Criteria
Severe – for adverse effects only	**Severe** or **major*** effects represent key factors in the decision-making process. They will principally occur where very important resources are subject to extreme effects. Such effects are generally, but not exclusively, associated with any recognised or designated sites/features of international or national importance. Mitigation measures are unlikely to remove or modify the adverse effects.
Major* - for beneficial effects only	**Major*** beneficial effects may occur if there is a substantial increase in the value of the environmental resource qualitatively or quantitatively on an international or national level.
Major	Major effects are important considerations on a regional or county level, principally affecting very important resources or creating extreme effects on important resources. Mitigation measures and detailed design work are unlikely to remove all the adverse effects by virtue of the magnitude of the predicted effects. Major beneficial effects may occur if there is a substantial increase in the value of the environmental resource qualitatively or quantitatively on a regional or county level.

Moderate	Moderate effects are important considerations at a district level, but are unlikely to be key decision making issues. They will principally occur where important resources are moderately or slightly affected, or where lesser resources are affected in the extreme. Mitigation measures and detailed design work may ameliorate some of the consequences on the affected communities or interests; however, some residual effects will still arise. Moderate beneficial effects may occur if there is a considerable increase in the value of the resource on a district level.
Minor	Minor effects are experienced at the local level and do not represent important issues in the decision making process. Assignment of this level of significance will principally occur if less important environmental resources experience more limited effects. Appropriate mitigation measures may reduce, remove or even reverse such effects. Minor beneficial effects may occur if there is only a limited increase in the value of the resource at a local level.
Negligible	Effects are assigned to this level if they are nil, imperceptible, negligible, within normal bounds of variation, or within margins of forecasting error when compared to the existing situation.

In order to determine the degree of any effect, a series of baseline surveys have also been undertaken for the purpose of the EIA. These are referred to in greater detail within the relevant ES chapters.

THE ENVIRONMENTAL STATEMENT

The ES is set out in two volumes as follows;

Volume 1

- Covering Letter
- Additional information submitted to Kent County Council since the registration of the planning application as follows:

i) Letter from J Freyther (SLR) to Angela Watts (KCC) dated 6th April 2009 - Additional Information on Odour and Dust Management (Kompogas System);

ii) Letter from J Freyther (SLR) to Angela Watts of KCC dated 23rd December 2008, including Drawing OP/4Proposed Site Layout (Dec 2008) and Drawing OP/10 Habitat Plan and Proposed Site Layout (Dec 2008);

iii) Surface Water and Foul Water Drainage Scheme, including Drawing OP/12 Proposed Site Drainage Arrangement (December 2008);

iv) Landscape Design and Visual Impact of Scheme, including Drawing OP/11 Proposed Landscape Layout (May 2008);

v) Contaminated Land Assessment October 2008;

vi) Letter to Richard Smith of KCC from Matthew Shephard (SLR) dated 18th March 2008 (Transport).

Volume 2 Environmental Statement

Reports the findings of the Environmental Impact Assessment (EIA) and is presented as follows:

Application Drawings

Non Technical Summary (NTS)

Design and Access Statement

Chapter 1	Introduction and Description of Development
Chapter 2	Policy Context
Chapter 3	Alternative Site Assessment
Chapter 4	Traffic and Transportation Assessment

Chapter 5	Air Quality Assessment
Chapter 6	Noise Assessment
Chapter 7	Hydrology and Flood Risk Assessment
Chapter 8	Ecological Assessment
Chapter 9	Cumulative Impact Assessment
Chapter 10	Conclusions

Otterpool Quarry,
Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 2 – Planning Policy Context

July 2009

SLR Ref 409.1376.00002

solutions for today's environment

PLANNING POLICY CONTEXT 2

INTRODUCTION

2.1 It is customary in undertaking an Environmental Impact Assessment (EIA), and in preparing an Environmental Statement (ES) in support of a planning application, to review planning policy at an international, national regional and local level, in order to consider whether the proposed development and the potential environmental implications are in conformity with such policy. This is particularly the case in the context of the requirements of Section 38(6) of the Planning and Compulsory Purchase Act 2004, which requires planning applications and appeals to be determined in accordance with the development plan, unless material considerations indicate otherwise. In effect, this section of the Act established a presumption in favour of granting permission for developments which are in accordance with the development plan.

2.2 A particular proposal does not need to accord with each and every policy in a development plan; the key issue is that it accords with the overall thrust of development plan policies taken as a whole.

2.3 This section will consider the proposed development at Otterpool within the context of international, national and local planning policies.

PLANNING POLICY

2.4 Schedule 4 to the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 does not make any specific reference to the inclusion of an assessment of planning policy. However, Chapter 6 of the DTLR Good Practice Guide on the preparation of an ES includes a section on "Policies and Plans". Paragraph 6.1 states that "An ES should include a section on policies and plans which are relevant to the environmental assessment of the development in question". The rationale for this is stated as "The objective is to demonstrate how these policy guidelines have been taken into account in developing the project and compiling the ES, and to provide a picture of the decision making context in which the environmental impacts will be evaluated".

2.5 It can be seen that there is some ambiguity between the Regulations and the guidance provided by the Government. However, it is clear, from published guidance, that the Government is committed to a plan led system, with the Development Plan forming the basis of all planning decisions. Accordingly, policies and plans play an important role in determining any planning application. In the spirit of the guidance, therefore this Section provides an overview of the policies that have been considered in undertaking the EIA.

GENERAL CONSIDERATIONS

2.6 Historically, National Planning Policy Guidance has been set out in a series of Planning Policy Guidance Notes (PPGs), which address general principles and policies together with detailed guidance on particular subjects and land use issues.

2.7 In September 2004, The Planning and Compulsory Purchase Act 2004 came into force. The Act establishes provisions that replace regional planning guidance and structure plans with Regional Spatial Strategies. Local Plans are to be replaced by a suite of documents referred to as Local Development Documents (LDDs). Planning Policy Guidance (PPGs) are currently being replaced by Planning Policy Statements (PPSs).

International Policies

2.8 The following International policies provide the overarching European framework for Waste applicable to the United Kingdom.

- European Community (EC) Landfill Directive 1999/31/EC; and
- EC Framework Directive for Waste 75/442/EEC as amended by 91/156/EEC.
- Waste Incineration Directive 2000/76EC.

REVIEW OF PLANNING POLICY

NATIONAL

2.9 The new Waste Strategy for England, 2007 has been published with challenging new targets for the diversion of waste from landfill with the following objectives:

- Meeting and exceeding the Landfill Diversion targets for biodegradable municipal waste in 2010, 2013 and 2020;
- To increase the diversion of non-municipal waste from landfill;
- To secure the investment in the infrastructure required to divert waste from landfill; and
- To get most environmental benefit from that investment through increased recycling of resources and recovery of energy.

2.10 In order to achieve this new recycling and composting targets for household waste have been set for at least 40% by 2010; 45% by 2015 and 50% by 2020. To help achieve this, the Government is proposing action to target particular materials, products and sectors. One of these is the promotion of anaerobic digestion for the treatment of food and green waste.

2.11 The proposed development and the existing approved waste management development at this location is considered to be in accordance with the objectives of the Waste Strategy 2007 and will help to achieve the new recycling and composting targets.

2.12 In addition to the Waste Strategy, PPS 10 – Planning for Sustainable Waste Management sets out the latest Government policy on planning for waste management facilities and marks a move away from the consideration of Best Practicable Environmental Option (BPEO). In its place PPS 10 sets out objectives for sustainable waste management and the proposed development is considered against these objectives in order to demonstrate its compliance with national waste planning policy. Paragraph 23 of PPS 10 makes it clear

that the Government now expects planning authorities to consider planning applications in accordance with this new policy and not to require BPEO to be demonstrated which would be inconsistent with the policies in PPS 10.

2.13 With regard to the objectives for sustainable waste management the proposed buildings will provide a modern, purpose built facility to deal with non hazardous, biodegradable waste and dry recyclables. This will provide a facility to enable the treatment of waste which would have previously gone to landfill to be moved up the waste hierarchy through the recovery of recyclate, energy and compost.

2.14 It is proposed to locate the facility on a brownfield, industrial site in East Kent within an area identified as requiring additional waste recycling and recovery capacity where it will manage waste from the local area, ensuring that the community is taking responsibility for its waste. It is proposed that, subject to planning permission, the facility will be operational by 2008 which will enable it to contribute towards the achievement of the landfill diversion targets from 2010 onwards.

2.15 Developing the recycling and anaerobic digestion facilities recognises that waste treatment facilities are a key part of meeting the targets in national and regional waste management strategies and it is therefore appropriate to make adequate provision for such facilities on sites that are well located and do not have any significant adverse effects on the environment or local communities.

2.16 The proposed development will meet the needs of waste disposal and collection authorities and the concerns and interests of the communities have already been considered and addressed by the assessments that accompany this planning application. This proposal will provide a facility to meet the recognised need for recycling and recovery capacity in this part of Kent.

REGIONAL

2.17 Regional planning policy is set out in the South East Plan adopted in May 2009. The South East Plan has also superseded the Kent and Medway Structure Plan. Relevant policies in the South East Plan are considered to be W3 and W4 which deal with regional and sub regional self sufficiency and require waste planning authorities to make overall provision for the amount of waste arising within the region and then to plan for net self sufficiency within their own individual areas. Policy W3 also states that 'provision of capacity for rapidly increasing recycling, composting and recovery should be made reflecting the targets and requirements set out in this Chapter' (Chapter 10 Waste and Minerals).

2.18 Policy W5 sets overall targets for the diversion of waste from landfill by encouraging the re-use, recycling and mechanical or biological processing facilities. For commercial and industrial waste the regional target is to increase diversion from 5.8Mt in 2010 to 8.7Mt by 2020. Policy W5 states that waste planning authorities should ensure that policies and proposals are in place to contribute to the delivery of these targets.

2.19 Policy W6 sets regional recycling/composting targets for commercial and industrial waste from 50% in 2010 to 60% in 2020 and states that waste

planning authorities should ensure that policies and proposals are in place to contribute to the delivery of these targets.

2.20 Policy W7 then identifies the individual waste management capacity requirements for waste planning authorities in the SE and indicates that these should be met by providing an appropriate mix of development opportunities for the waste management industry. Kent and Medway will have to provide an appropriate mix of development opportunities for waste management facilities to deal with 2120 thousand tonnes in 2008-2010, increasing to 2663 thousand tonnes in 2021-2025. Kent is identified as having a shortfall of 0.761 million tonnes in terms of capacity for recycling and composting.

2.21 Policy W12 seeks to actively encourage the development of anaerobic digestion technology and for schemes to operate to the highest pollution control requirements and to incorporate recycling and recovery facilities wherever practicable.

Policy W17 identifies the locational criteria for waste management facilities, which are: good accessibility from urban areas; good transport links; compatible land uses, including previous industrial land; and no unacceptable impacts on the environment or local community.

2.22 The proposed development will make a positive contribution to regional and sub regional self sufficiency and will contribute to regional targets for the diversion of waste by landfill by providing appropriate recycling capacity and recovery capacity which is actively encouraged by the regional plan. In addition the proposed site is considered to comply with the locational requirements identified by policy W17.

2.23 The proposed development is therefore considered to comply with regional planning policy.

LOCAL

2.24 Local waste policy is provided by the Kent Waste Local Plan, (KWLP), which was adopted in March 1998. Work has also commenced on the production of new waste development plan documents and the reports produced by Jacobs Babtie have been reviewed to confirm that the proposed development complies with the emerging waste policy framework for Kent.

2.25 Policy W1 of the KWLP states that decisions will be made in accordance with the principles of sustainable development for the management of wastes arising within Kent based on the waste hierarchy. The proposed facility is to meet an identified need for recycling and recovery capacity for industrial, commercial and municipal waste arisings within east Kent and will be dealing with waste that would have previously gone directly to landfill. It is therefore considered to be in accordance with policy W1.

2.26 Policy W2 of the KWLP identifies a series of environmental designations where waste management operations will not be permitted if they have a significant adverse impact on these designations. The proposed development will not affect any of the designations listed and does not conflict with policy W2.

2.27 Policy W3 deals with proposals for waste processing and transfer at locations not identified on the Proposals Map, which is the case Otterpool Quarry. Proposals will not be permitted unless they can gain ready access to the primary or secondary route network and are located within an area of established general industrial type use. The proposed site has direct access on to the A20 and is a brownfield site formerly used for industrial purposes. It is therefore considered to comply with the locational requirements of policy W3.

2.28 Policy W9 identifies locations suitable in principle for waste separation and transfer and indicates that proposals at other locations will be considered against whether they:

- Seek to minimise the impact on local and natural environments;
- Have acceptable access to the main road network; and
- Are part of a location within an industrial type area.

2.29 The assessments that accompany the proposed development demonstrate that there would be no significant adverse effects on the environment or local community and that the site has a satisfactory access and is an industrial type location. The proposed development is therefore considered to comply with policy W9.

2.30 Policy W10 deals with digestion and composting and again the proposed development is considered to comply with the locational requirements of this policy because the proposed development will be located within an industrial type area; it will not cause significant harm to residential amenity due to noise, dust, odour or visual impact; it has ready access on to the main road network; it is located within a former quarry and will not be obtrusive in the landscape; and the impacts will be minimised.

2.31 Policy W18 requires measures to control noise, dust and odours and the relevant technical assessments are attached as appendices to this statement. W19 and 20 seek the protection of ground and surface water interests and flooding and drainage issues. Again the relevant assessment is included as an appendix to this statement. Policy W21 deals with ecological matters and no features, habitats or species have been identified as being adversely affected by the proposed development, as set out in the Ecology Assessment.

2.32 Policies W22 and 23 deal with ensuring the site has an adequate access and the highway network can deal with the vehicles travelling to and from the site and to ensure that mud and debris is not deposited on the highway. The transport assessment demonstrates that there would be no adverse traffic impacts as a result of the proposed development.

Policy W24 deals with design and external appearance and the requirements of policy W25 and W31 to group buildings, take advantage of topography, minimise visual and noise intrusion, use appropriate colour choices and incorporate landscaping proposals in to the scheme to help reduce the impact of the proposed buildings, have all been considered in finalising the proposed design and layout.

2.33 Evidence gathering for the development of spatial options for the emerging Waste Development Framework identified the ongoing need to establish suitable recycling capacity to deliver the challenging targets identified for municipal, industrial and commercial waste streams. This is important as the Needs Assessment work carried out by Jacobs Babtie is based on the premise that significant proportions of waste in Kent will not require treatment by recovery because it will have already either been recycled or composted.

The establishment of the proposed MRF is therefore a key element in delivering this recycling capacity and a necessary element to ensure the assumptions made in the Jacobs Babtie work on the emerging Waste Development Framework are delivered, as SLR are not aware of any facilities currently available to pre-treat, either by segregation or sorting, commercial waste within the districts of Ashford, Dover and Shepway. It is further noted that the Needs Assessment work by Jacobs Babtie clearly concludes that between three and five composting facilities with an operating capacity of between 20 to 50 ktpa are required and that anaerobic digestion could be included within that assessment as an alternative to composting. Since the preparation of that report in 2004 no additional relevant facilities have been consented in the east Kent area.

2.34 In conclusion the proposed site meets the locational requirements for the type of waste management development proposed, has direct access on to the main route network and is available and deliverable to the waste management industry. It is also in accordance with current national, regional and local waste management policy and would meet a need for the type of facilities identified as being required to deliver a sustainable waste management strategy by the work being carried out on the emerging Waste Development Framework for Kent.

CONCLUSION

2.35 The relevant planning policies have been considered at international, national, regional and local level. The South East plan has identified an 'immediate and acute' shortfall in the capacity required to achieve the ambitious targets for recycling, composting and other forms of recovery. The Plan goes on to say that there needs to be a rapid increase in management capacity and that waste planning authorities need to address this shortfall now.

Local waste planning policies recognise the acute shortfall in green and food waste management facilities in Kent. The policies are supportive of waste management facilities which divert waste away from landfill as long as they do not have significant adverse impacts on local communities or the environment.

2.36 In terms of location, the use of previously developed land or existing industrial sites for waste management facilities is also supported by national, regional and local policies. Furthermore, the Otterpool facility is considered to be in accordance with the objectives of sustainable waste management as it is proven technology which will manage significant amounts of east Kent's waste, and generate electricity.

Otterpool Quarry
Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 3 - Alternative Site Assessment

409.1376.00002

Countrystyle Recycling Ltd

September 2009

CONTENTS

INTRODUCTION

Background

This report has been prepared by SLR Consulting Ltd (SLR) as part of the Environmental Impact Assessment (EIA) prepared in respect of the proposed Materials Recycling Facility (MRF) and Anaerobic Digestion (AD) Facility at Otterpool Quarry.

This Alternative Site Assessment enables Countrystyle Recycling Ltd to demonstrate the benefits of the Otterpool Quarry site and also how a facility in this location can make a significant contribution to sustainable waste management in East Kent.

The process of an alternative site assessment is one that by its nature needs to take account of regulatory issues, including planning policy, commercial opportunities, the availability of land and amenity and environmental constraints and opportunities.

Requirement for Alternative Site Assessment

The requirement for an Alternative Site Assessment (ASA) is set out in the Environmental Impact Assessment Regulations 1999 (as amended) and EIA Guide to Procedures (ODPM January 2000)

The aim of the ASA is to provide;

'An outline of the main alternatives studied by the applicant…and an indication of the main reasons for his choice, taking into account the environmental effects'.

Methodology

The assessment of alternative sites is largely a desk based study with a brief site reconnaissance of the short listed sites to confirm the findings of the desk based work.

Stage 1 of the process comprises a review to ascertain which sites are available for development in East Kent and, specifically within the Districts of Ashford, Dover and Shepway in line with the intended sphere of influence of the proposal . Telephone conversations were held with Local Planning Authorities and local land agents and from these discussions, 12 potential, alternative sites were identified. These are as follows;

- Orbital Park, Ashford;
- Axiom at Orbital Park, Ashford;
- White Cliffs Business Park, Dover;
- Silver Springs, Caesar's Way, Cheriton, Folkestone;
- Former Richborough Power Station;
- Waterbrook, Sevington, Ashford;

- Enterprise Way, Link Park, Lympne
- Cheriton Park, Folkestone;
- Hawkinge West, Hawkinge;
- Shearway Business Park;
- Betteshanger Business Park;
- Eureka Business Park, Ashford

The site locations are shown on Drawing 1.

The second stage was to sift the 13 sites based on a number of criteria considered essential or desirable for a waste management site. The sites would score higher or lower depending on the extent to which they fitted the criteria. The results allowed SLR to establish which of the 13 sites would be most suitable for a combined MRF and AD Facility.

The rating criteria were as follows;

- Proximity to housing;
- Proximity to road network;
- Existing land use;
- Ecological designations;
- Water environment and flood risk;
- Availability (i.e. be available for purchase/long term lease at the time of the search exercise); and
- Size of site (at least 2 hectares).

Inappropriate locations included;

- Land allocated for other uses in Development Plans/Local Development Frameworks;
- Ancient Woodlands;
- Undeveloped Coastal Zones;
- Areas of Outstanding Natural Beauty;
- Groundwater Protection Zones;
- Scheduled Ancient Monuments;
- Green Belt;
- Floodplains;
- Green field sites; and
- Sites remote from the areas of need for facility and primary road network.

In addition to these criteria, a policy review was undertaken to determine national, regional and local, locational criteria. A review of the relevant policies is set out in the following section.

POLICY REVIEW

Introduction

The consideration of a potentially suitable site for an AD facility and MRF must take into account the policy background as it sets out the main factors which must be taken into account when choosing a site for waste management facilities.

National Policy

PPS 10 – Planning for Sustainable Waste Management

PPS 10 sets out the Government's objectives for sustainable waste management. The proposed development has been considered against these objectives in order to demonstrate its compliance with national waste planning policy.

In terms of locating waste management facilities, PPS 10 states that when identifying suitable sites, previously developed land and opportunities to co-locate facilities together with complementary activities should be considered.

Annex E of PPS 10 sets out the main factors waste planning authorities should take into account when testing the suitability of a site for waste management purposes. These are:

- **protection of water resources**, considerations will include the proximity of vulnerable surface and groundwater. For landfill or landraising, geological conditions and the behaviour of surface water and groundwater should be assessed both for the site under consideration and the surrounding area. The suitability of locations subject to flooding will also need particular care;

- **land instability**, locations, and/or the environs of locations, that are liable to be affected by land instability will not normally be suitable for waste management facilities;

- **visual intrusion**, considerations will include (i) the setting of the proposed location and the potential for design-led solutions to produce acceptable development; (ii) the need to protect landscapes of national importance (National Parks, Areas of Outstanding Natural Beauty and Heritage Coast);

- **nature conservation**, considerations will include any adverse effect on a site of international importance for nature conservation (Special Protection Areas, Special Areas of Conservation and RAMSAR sites) or a site with a nationally recognised designation (Site of Special Scientific Interest, National Nature Reserves);

- **historic environment and built heritage,** considerations will include

any adverse effect on a site of international importance (World Heritage Sites) or a site or building within a nationally recognised designation (Scheduled Monuments, Conservation Area, Listed Buildings, Registered Historic Battlefields and Registered Parks and Gardens;

- **traffic and access,** considerations will include the suitability of the road network and the extent to which access would require reliance on local roads;

- **air emissions, including dust,** considerations will include the proximity of sensitive receptors and the extent to which adverse emissions can be controlled through the use of appropriate and well-maintained and managed equipment and vehicles;

- **odours,** considerations will include the proximity of sensitive receptors and the extent to which adverse odours can be controlled through the use of appropriate and well maintained and managed equipment;

- **vermin and birds,** considerations will include the proximity of sensitive receptors. Some waste management facilities, especially landfills which accept putrescible waste, can attract vermin and birds, and may be influenced by the distribution of landfill sites;

- **noise and vibration,** considerations will include the proximity of sensitive receptors. The operation of large waste management facilities in particular can produce noise both inside and outside buildings. Intermittent and sustained operating noise may be a problem if not kept to acceptable levels and particularly if night-time working is involved;

- **litter,** litter can be a concern at some waste management facilities; and;

- **potential land use conflict,** likely proposed development in the vicinity of the location under consideration should be taken into account in considering site suitability and the envisaged waste management facility.

Regional Policy

The Regional Spatial Strategy for the South East (RSS) May 2009

Policy W17 of the RSS 'Location of waste Management Development) is intended to ensure that waste development documents should identify locations for waste management facilities, give priority to safeguarding and expanding suitable sites with an existing waste management use and good transport connections. Furthermore the

policy recognises that particular emphasis should be given to sites with good accessibility from existing urban areas or major new or planned development, as well as good transport links and compatible land use.

Local policy

Kent Waste Local Plan 1998

Despite the age of this plan, it contains a number of saved policies against which this proposal will be considered. The Kent Waste Local Plan (KWLP) is accompanied by a Proposals Map which identifies a number of sites which are appropriate for certain types of waste management facilities in principle. 9 sites are identified in East Kent and of these, 8 are considered suitable for waste transfer or separation facilities. Although there is a policy relating to composting and digestion, no sites are identified for this purpose on the Proposals Map.

Mindful of the fact that sites were not allocated for organic waste treatment specifically, it is considered appropriate that a review of any site allocated for waste uses (irrespective of what type) in order to assess if any opportunity exists for such a use since the adoption of the Plan itself.
There are 3 sites listed as Preferred sites within the KWLP Proposals Map that are located within Ashford, Shepway or Dover. In turn, these are commented on below:

- Chart Leacon (Proposal Map H) – this site is considerably smaller than the footprint required for the Otterpool combined development. It has also been brought forward in recent years by the Brett Group and the scheme was abandoned due to limitation on the developers proposals (insufficient space) and highway issues that were incapable of resolution.

- Shorncliffe and Hawkinge (proposal Map P) – these sites are managed by Kent County Council Waste Disposal Authority (KCC WDA) and are part of the County's network of Waste Transfer and Household Waste Recycling Centres (HWRC). There are clear constraints on either site in terms of future development and therefore both are significantly smaller than the minimum footprint requirement for the Otterpool development.

- Whitfield (Proposal Map O) – again managed by KCC WDA, and again too small for the proposed development. It is also a key location for both Waste Transfer and HWRC for the District and therefore it is considered highly important in its current use.

Otterpool Quarry is not identified on the Proposals Map. However, the development of waste management facilities at other locations is considered by the Kent Waste Local Plan, subject to certain provisos e.g. ready access to main highway network. In terms of locations for waste transfer and separation facilities, Policy W9 states these have to have ready access to the main road network and in or adjacent to existing waste management facilities or part of a location within an established or committed general industrial type area.

Policy W10 states that facilities for composting and digestion will be permitted subject to the site being industrial or industrial type area and would not cause significant harm to residential amenity due to noise, dust, odour or visual impact.

Kent Minerals and Waste Development Scheme 2009 – Second Review

Under this programme, Kent County Council will prepare a Waste Management Site Development Plan Document (DPD). An updated waste proposals map will be prepared upon adoption of the first waste related DPD by the County Council. The map will identify suitable locations and allocate sites for all waste management developments in Kent. The DPD is expected to be adopted in November 2012 but this will be dependent on the outcome of ongoing reviews.

Policy 29 'Sustainable Waste Management' states

'In accordance with the principles of sustainable waste management, appropriate provision of land should be made for the safe management, recycling, treatment and disposal of forecast waste arising in the area, together with an appropriate proportion of regional waste flows as necessary, in the period to 2011.
Provision will be made for the development of waste management facilities employing the best practicable environmental option (BPEO), utilising previously developed land where appropriate, in locations where :

- the facility is as close as practicable to the particular waste stream source;
- satisfactory access to the main / principal highway network can be provided,
- making use of non-road facilities where practicable;
- the nuisance to neighbouring land uses is minimised;
- suitable provision can be made for appropriate reclamation/aftercare;
- the proposals respect the character of the locality;
- no threat is posed to watercourses and surface/groundwater resources; and
- proposals for the recovery of value from wastes being treated, including energy generation, composting and recycling can be included where practicable and environmentally acceptable'.

INITIAL SITE SELECTION

The site selection criteria identified by SLR Limited are reiterated in the relevant planning policy, particularly Annex E of PPS10. It is considered that the using these criteria will enable the 17 sites to be judged against each other. The assessment criteria are;

- Proximity to housing;
- Proximity to road network;
- Existing land use;
- Deliverability (i.e. within control of the Local Authority or the Waste Management Industry);

- Ecological designations;; and
- Water environment and flood risk

Proximity to housing

Whilst waste management facilities including AD Facilities and MRFs have been built close to houses, these facilities can have an impact on the amenity of residential areas in terms of traffic, noise and general activity. Therefore, sites in close proximity to housing score less than sites which are further from housing.

The sites have been scored as follows;

Site boundary within 0 – 250 metres of housing	**0 Points**
Site boundary within 251 – 500 metres of housing	**1 Point**
Site boundary within 501-750 metres of housing	**2 Points**
Site boundary within 751-1000 metres of housing	**3 Points**
Site boundary greater than 1000 metres of housing	**4 points**

Proximity to Road Network

The potential for the facility to be well served by the primary road network is a key consideration in the site selection process. The waste management facilities will generate HGV traffic thus sites with good access to A roads and motorways junctions score higher than those with poorly located in terms of distributor roads.

The sites have been scored as follows;

Site 2001m or more from any of the following roads	**0 Points**
Site 500m or less from other A road	**1 Points**
Site 2000m or less from Motorway Junction	**2 Points**

Existing Land Use

The principle of sustainable development places strong emphasis on the use of brownfield (previously developed land) for new development and this is supported by national, regional and local level planning policies.

The scoring is consequently weighted in favour of brownfield sites to reflect its importance in planning policy. Land previously used for minerals or waste development is not classified as brownfield land yet could not be reasonably considered as Greenfield. For the purposes of this assessment, this land has been designated as ‘beigefield land’ i.e. an intermediate category.

The sites have been scored as follows;

Greenfield Land	**0 Points**
Beigefield Land	**2 Points**
Brownfield Land	**4 Points**

Ecology

Waste management facilities have the potential to impact on ecologically sensitive sites and their surroundings. East Kent is subject to a number of statutory and non statutory ecological designations, including Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific Interest and Sites of Nature Conservation Interest.
Weighting has been given in favour of those sites further from statutory nature conservation areas. Geological SSSIs are not included as it is not considered that the proposed development could have an adverse impact on these.

The sites have been scored as follows;

Sites less than 500m from statutory nature conservation site	**0 Points**
Site 501 to 1000m from statutory nature conservation site	**1 Point**
Site 1001m to 2000m from statutory nature conservation site	**2 Points**
Site more than 2000m from statutory nature conservation site	**3 Points**

Size of Site

One of the key site selection criteria identified was size of site i.e. the site had to be over 2 hectares in size to allow the required size of buildings to be located and the site to operate efficiently.

Site less than 2 hectares in size	**0 Points**
Sites greater than 2 hectares in size	**1 Point**

Water Environment and Flood Risk

The issue of flood risk is a high profile consideration that must be taken into account at the outset of the site selection process. The weighting system has been based on the Environment Agency's Flood Risk Map which reflects the potential for flooding at each site. Waste management is recognised as a less vulnerable use of land that may be acceptable in flood zones 2 and 3. Nevertheless, sites within Flood Zone 1 score highest as the sites will be less problematic to construct and operate than sites within flood zones 2 and 3.

The sites have been scored as follows;

Site within Flood Zone 3	**0 Point**
Site within Flood Zone 2	**1 Points**
Site within Flood Zone 1	**2 Points**

Availability

Is the site available for purchase/long term lease at the time of the search exercise? If so, it is more likely to be made available within the timescales necessary to meet Kent County Council's targets for the provision of waste management facilities and diversion of waste from landfill.

Site not available for purchase/long term lease in short term	**0 Points**
Site available for purchase/long term lease in short term	**1 Point**

Site Descriptions

The 12 sites are described below and their locations can be seen in Drawing 2 'Alternative Site Locations'.

- **Orbital Park, Ashford** is situated to the south east of Ashford on the A2070, leading to Junction 10 of the M20; Orbital Park is a strategic site with direct access to Ashford's southern orbital road and Junction 10 of the M20. The site is described as 'fully serviced and landscaped and is suitable for office, light industrial and distribution uses. It is a modern business park, developed from 1990's with remaining development sites and existing industrial and commercial units'. The site is over 2km from both statutory ecological and landscape designations. The largest plot available is 0.95 ha

- **Axiom at Orbital Park, Ashford**

  Is a new production warehouse development of eight new units is situated to the south east of Ashford on the A2070, leading to Junction 10 of the M20. Phase I, units available from 2,745 sq ft to 23,724 sq ft. Phase II, design and build opportunities available for self contained or terraced units from 7,686 sq ft up to 113,669 sq ft. This site

- **White Cliffs Business Park, Dover**

  Is located on the A2, London to Dover road, at its junction with the A256 - 15 miles from Canterbury, one mile from the Port of Dover, 20 miles from Jct.7 of the M2, 10 miles from Jct.13 of the M20 and the Channel Tunnel. 13 plots are offered, one of which is over 2ha in size and agent has stated that plots could be merged to create other plots over 2ha. The Business Park is located on Greenfield land.

- **Silver Springs, Caesar's Way, Cheriton, Folkestone**

  Located next to Junction 13 of the M20, this 4 hectare plot is undeveloped and needs planning permission. The site is not currently on the market.

- **Former Richborough Power Station**

  Since being decommissioned in 1996, the site is largely vacant .This site is shown on the Dover Local Plan proposals map to be at risk from tidal flooding. To the east of the site are a Special Protection Area, Special Area of Conservation and a Special Landscape Area. To the west is an area of local landscape significance.
  The site does not have a current valid planning permission.

- **Waterbrook, Sevington, Ashford**

  Located close to Junction 10 of the M20, This vacant site with railhead could supply a site over 2 hectare although the recent planning permission granted for aggregate and waste transfer is not being progressed at the present time due to a limiting Section 106 Agreement limiting vehicle movements during the morning period. Further, it is considered that the space available for the proposed waste transfer is too small to accommodate the planning permission granted and a deliverable scheme. Recent discussion with Ashford BC and KCC WDA have highlighted Ashford BC opposition to further waste development at Waterbrook and a preference for development to take place at Sevington North following the proposed additional 10A M20 junction – probably at least 4-5 years hence.

- **Enterprise Way, Link Park, Lympne**

  Former airport site but largely open grassland. Plots up to 1.92 ha. Designated industrial park with good access to main highway network and larger urban centres. Less than 500m from a SSSI although this is the same geological SSSI adjacent to Otterpool. This location was opposed as suitable for waste management purposes by Shepway DC as an inappropriate location when proposed under the initial site assessment work undertaken by KSS as part of their Waste Development Framework.

- **Cheriton Parc, Folkestone**.

  Cheriton Parc benefits from a prominent location within a very short distance of junction 12 of the M20 motorway and a few minutes from the Channel Tunnel Terminal. The site has a key location within the Channel Tunnel Corridor. Since considering this site, we have found out that the only plot remaining is 0.8ha and is restricted to B1 use and therefore not suitable for MRF/AD. Less than 500m from a SSSI.

- **Hawkinge West, Hawkinge**

  Greenfield site adjacent to residential development. This 10 hectare site is located to the north of Folkestone and the M20 and west of the village of Hawkinge. Hawkinge West has the potential to provide 335,000 sq ft of floorspace and 900 jobs. This site is well located for access to the motorway network. The agent has since indicated that waste uses would not be suitable at this site.

- **Shearway Business Park**

  Located adjacent to Junction 13 of the M20 and the Channel Tunnel Terminal, this 25 hectare allocation is a key strategic employment site in East Kent. The first phase of 10 hectares is owned by SEEDA and has recently been serviced with new drainage, roads and structural landscaping. With its proximity to the major transport network it is now a prime site for new development. The remaining allocation is in private ownership and has scope for further industrial and commercial development. B1, B2 and B8. Less than 500m from statutory ecological site. The agent has indicated that he does not believe waste development would be suitable in this location.

- **Betteshanger Business Park**

  Betteshanger Business Park is a modern business park located in East Kent, between Dover, Canterbury and Ramsgate and is reached from London via the M2/A2 link. The site has direct access from the A258 between Deal and Sandwich. Betteshanger Business Park comprises a new landscaped area of approximately 20 hectares (50 acres) with 6.17 hectares (15.24 acres) of serviced plots for new development. Outline planning consent was granted in 2004 for up to 22,300 sq m (240,000 sq ft) of employment space. More than 2km from statutory ecological site. However, the agent does not think the Business Park offers any suitable plot for a waste management use.

- **Eureka Business Park, Ashford**

  Located next to Junction 9 of the M20, Eureka Business Park has plots available but the agent has stated that a high office content is sought and that waste management use ifs unlikely to be appropriate for this Park. We have since been told that the Business Park is B1 use only.

Table 1

CONCLUSION

The Alternative Site Assessment has used the above criteria to assess all the sites against each other in terms of their suitability for an Anaerobic Digestion facility and MRF. The results are presented in .

Many of the sites were Greenfield, which goes against the policies of PPS10 and the Development Plan which support brownfield sites or previously used sites for waste management developments. Many sites were also too small and/or provided a standard industrial building which may have been suitable for a MRF but not for an AD Facility, which has to be purpose built,

The top scoring sites were Axiom at Orbital Park and Cheriton Parc which scored 12 points out of a possible 19. Otterpool Quarry, which is the subject of this application scored 10 points, as did Waterbrook (Sevington) and Eureka Business Park in Ashford. All the other sites scored less than 10.

Although Orbital Park and Cheriton Parc scored higher than Otterpool Quarry, the available plots at both are smaller than 2ha and Cheriton Parc is limited to B1 use thus unsuitable for the proposed use. Eureka Business Park is also limited to B1 use and Waterbrook is not considered appropriate for waste management uses by Ashford BC, particularly given the recent Brett consent.

The conclusion has therefore been reached that the most appropriate site of those considered as part of this alternative site assessment, is Otterpool Quarry.

DRAWING 1
LOCATION OF ALTERNATIVE SITES

REF NO	ALTERNATIVE SITE
1	Orbital Park, Ashford, Kent
2	Axiom at Orbital Park, Ashford, Kent
3	White Cliffs Business Park, Dover, Kent
4	Silver Springs, Caesar's Way, Cheriton, Folkstone
5	Former Richborough Power Station,
6	Waterbrook, Sevington
[redacted]	Rye Industrial Estate
8	Enterprise Way, Link Park, Lympne
9	Cheriton Park Folkestone
10	Hawkinge West, Hawkinge, Kent
11	Shearway Business Park
12	Betteshanger Business Park
13	Eureka Business Park

MARGATE
HERNE BAY
WHITSTABLE
THANET DISTRICT
BROADSTAIRS
RAMSGATE
SWALE DISTRICT
CANTERBURY DISTRICT
CANTERBURY
SANDWICH
DEAL
DOVER DISTRICT
ASHFORD
ASHFORD DISTRICT
SHEPWAY DISTRICT
DOVER
OTTERPOOL QUARRY
FOLKESTONE
HYTHE
TENTERDEN
NEW ROMNEY
RYE
LYDD

160000
140000
120000
590000
610000
630000

LEGEND

- OTTERPOOL QUARRY
- ALTERNATIVE SITES
- SCHEDULED ANCIENT MONUMENTS
- REGISTRERED PARKS AND GARDENS
- WORLD HERITAGE SITES
- REGISTRERED PARKS AND GARDENS
- BATTLEFIELDS
- SCHEDULED ANCIENT MONUMENTS
- ANCIENT WOODLANDS
- AREAS OF OUTSTANDING NATURAL BEAUTY
- HERITAGE COAST
- LOCAL NATURE RESERVES
- NATIONAL NATURE RESERVES
- RAMSAR SITES
- SITES OF SPECIAL SCIENTIFIC INTEREST (SSSI)
- SPECIAL AREAS OF CONSERVATION
- SPECIAL PROTECTION AREAS

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COUNTRYSTYLE RECYCLING

OTTERPOOL QUARRY

DESIGNATIONS

1

Scale 1:200,000 @ A3

Date JULY 09

Table 1 Alternative Site Scoring

SITE NAME	PROXIMITY TO HOUSING					PROXIMITY TO PRIMARY ROAD NETWORK			AVAILABILITY		EXISTING LAND USE			DISTANCE FROM STATUTORY ECOLOGICAL SITE)				SIZE OF SITE		FLOOD ZONE			TOTAL
	0-250M	251-500M	501-750M	751-1000M	>1000M	>2001M FROM DESIGNATED ROADS	<500M FROM A ROAD	<2000M FROM MOTORWAY JUNCTION	SITE NOT AVAILABLE FOR B2 USE AND OR HAS NO PLANNING PERMISION FOR B2 USE.	SITE AVAILABLE FOR B2 USE	GREENFIELD LAND	BEIGEFIELD LAND	BROWNFIELD LAND	<500M	501-1000M	1001-2000M	OVER 2000M	LESS THAN 2 HA	MORE THAN 2 HA	ZONE 3	ZONE 2	ZONE 1	
SCORE	0	1	2	3	4	0	2	4	0	1	0	2	4	0	1	2	3	0	1	0	1	2	
OTTERPOOL QUARRY	X						X			X		X				X			X			X	10
AXIOM AT ORBITAL PARK			X				X	X		X	X						X	X				X	12
BETTESHANGER BUSINESS PARK	X					X			X				X				X	X				X	9
CHERITON PARC, FOLKESTONE			X					X	X				X	X				X				X	12
LINK PARK, LYMPNE		X				X				X	X			X								X	5
RICHBOROUGH POWER STATION			X			X			X				X	X					X		X		8
HAWKINGE WEST, HAWKINGE	X					X			X		X						X					X	5
ORBITAL PARK, ASHFORD		X				X				X	X						X	X				X	7
SHEARWAY BUSINESS PARK	X							X		X	X			X				X				X	7
WHITE CLIFFS BUSINESS PARK, DOVER	X						X			X	X						X		X			X	9
SILVER SPRINGS, CHERITON, FOLKESTONE	X							X	X		X				X			X				X	7
WATERBROOK, SEVINGTON			X					X	X		X					X		X				X	10
EUREKA BUSINESS PARK		X						X	X		X						X	X				X	10

Otterpool Quarry, Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 4 –Traffic and Transport

SLR Ref 409.1376.00002

COUNTRYstyle RECYCLING

WASTE MANAGEMENT SOLUTIONS

November 2007

solutions for today's environment

CONTENTS

TABLES

APPENDICES

DRAWINGS

4.0 INTRODUCTION

SLR Consulting Limited has been appointed by Countrystyle Recycling Ltd to prepare a Transport Assessment in support of a planning application for the development of Anaerobic Digestion and Materials Recycling / Transfer facilities at Otterpool Quarry, Sellindge, Kent.

The application site is a redundant mineral and construction materials processing facility with the benefit of a dedicated vehicle access onto the A20 within 3km of Junction 11 of the M20. The development would accept organic, green and recyclable wastes from within East Kent. Compost products and non-recyclable residual waste would be exported from site.

The following describes the development proposals in greater detail and assesses the highway network within the vicinity of the application site. The proposed trip generation and routing on the highway network are assessed and the resultant impacts on highway capacity quantified. A qualitative assessment is made of environmental impacts of site traffic, with particular regard to impacts caused by HGVs.

To accord with current best-practice, consideration is given to site accessibility and to the opportunities for staff to use non-car travel modes.

This report has been prepared in accordance with the Guidance on Transport Assessment (DfT, 2007). The report also takes into account the latest Planning Policy Guidelines as directed by PPG13: Transport and relevant local guidance issued by Kent County Council.

4.1 PROPOSED DEVELOPMENT

4.1.1 Site Location and Existing Use

The location of the application site is shown on Drawing 1. The site is located adjacent to the A20 Ashford Road, midway between Ashford to the west and Folkestone to the east. Access to the site is gained directly from the A20 via a dedicated simple priority junction. The A20 proceeds northeast from the site access and provides direct access to the M20 motorway at Junction 11, a driving distance of approximately 3km.

The application site is not currently in use and thus generates no vehicular traffic. The site was most recently operated by Tarmac Quarries as a mineral and construction materials processing facility for the purpose of asphalt and ready mixed concrete production. The application site therefore has a history of generating HGV traffic, which previously accessed the A20 via the existing priority junction.

4.1.1 Site Facilities

The development proposals comprise the following elements:

- office, mess, weighbridge and parking facilities;
- an Anaerobic Digestion Plant (AD); and
- a Materials Recycling Facility (MRF).

The AD plant would process organic and green waste from both commercial waste producers and municipal sources within East Kent. The plant would process an anticipated volume of 20,000 tonnes per annum, comprising the following waste streams:

- source separated organic waste (fruit and pre-consumer organic waste);
- post-consumer separated organic waste from commercial and industrial producers;
- source separated green waste from municipal sources within East Kent; and
- source separated mixed organic (food) waste from municipal sources within East Kent.

The AD process would generate around 9,750 tonnes of saleable compost products per annum.

The MRF would manage co-mingled recyclable materials generated by commercial and industrial waste producers, together with waste streams from municipal sources. The MRF would process an anticipated volume of 75,000 tonnes of recyclable waste per annum. Baled recyclable product and non-recyclable residual waste would be exported in bulk form.

A more detailed assessment of waste throughput and the accompanying vehicle trip generation is provided in Section 4.

It is proposed that all imports and exports would take place between 07:00 and 17:00 Monday to Friday, and between 07:00 and 13:00 Saturdays.

The operation would employ at least 25 staff.

4.1.2 Access Arrangements

The development proposals include improvements to the existing access arrangements on the A20. The proposed access scheme is shown in outline on Drawing 2 and would comprise the following elements:

- access road width 7.3m;
- eastern radius - 15m with 1:10 taper over 25m;
- western radius - 10m;
- widening of the A20 by 1m at the junction bellmouth;
- 4.5m x 160m visibility splay to the nearside kerb; and
- appropriate signage.

The junction has been designed in accordance with TD 42/95 - Geometric Design of Major / Minor Priority Junctions[1]. As discussed in greater detail below, a speed survey undertaken at the access location recorded 85th percentile speeds of 85kph. TD 42/95 states that a design speed of 85kph requires 'y' visibility of 160m to the nearside kerb, which can be achieved in both directions.

The large majority of HGVs would access / egress the site to the east in the direction of the M20; a 10m radius is therefore considered appropriate for the western radius. A swept path assessment has been undertaken on the proposed layout for a 16.5m articulated vehicle; the results are included on Drawing 3. The proposed site access detail is set out in Drawing HD1. All HGV movements would be adequately accommodated by the junction layout.

The development would provide two weighbridges for incoming and outgoing traffic. The weighbridges would be located approximately 50m from junction bellmouth, thereby providing capacity for at least 3 queuing HGVs. It will be shown later in this report that approximately 8 incoming HGV movements per hour are anticipated, which would be adequately accommodated by the access arrangements with no queuing back on to the A20 expected.

[1] DMRB Volume 6 Section 2 Part 6 TD 42/95 - Geometric Design of Major / Minor Priority Junctions

4.2 BASELINE REVIEW

4.2.1 Planning Policy Context

Local Transport Plan for Kent (2006-2011)

The Government introduced the concept of Local Transport Plans (LTP) in their 1998 White Paper on Transport, 'A New Deal for Transport: Better for Everyone'. The Transport Act 2000 made it a statutory requirement for all local transport authorities to produce LTPs. The second Local Transport Plan for Kent was submitted to the Government in March 2006 and supersedes the original LTP.

The Council's long terms vision for Kent (by 2025) is:

> *To provide good, safe accessibility to jobs and services for all sections of the community in Kent, and to improve the environment and health of the community by reducing congestion and pollution, widening the choice of transport available, and by developing public transport, walking and cycling.*

Kent's LTP is based upon ten strategic objectives, which are listed below:

- Accessibility: support independence and reduce social exclusion by improving transport links to key destinations and bringing services closer to communities;
- Demand Management: reduce the demand for transport both within and through Kent;
- Environmental, Heritage and Communities: stabilise and, where possible, reverse the adverse effect of transport and its infrastructure on the natural and built environment and on local communities;
- Health: improve the health of Kent residents by reducing the impact of transport, encouraging increased physical activity and enhancing access to key health facilities;
- Integration: encourage integration to maximise the use of sustainable modes and therefore widen choice for Kent residents;
- Keep Kent Moving: manage and maintain the local highway network to maximise the safe and efficient use of road space and provide reliable journey times;
- Road Safety: provide a safe and secure transport system for all users throughout the County;
- UK Gateway: ensure that international traffic covers its costs, minimises the impact on Kent and its residents and maximises the use of rail;
- UK Connections: press for more efficient, sustainable transport links with London and the rest of the UK; and

- Sustainable Regeneration: promote development that reduces the need to travel while supporting the local economy.

Policy included within the LTP which has particular relevance to the development site is discussed below.

4.2.2 Road Safety

The LTP states that Kent is committed to reducing road casualty rates in line with national targets introduced by the Government's Road Safety Strategy. The targets comprise:

- a 40% reduction in the number of people killed or seriously injured from 2000 to 2010;
- a 50% reduction in the number of children killed or seriously injured from 2000 to 2010; and

- a 10% reduction in the number of slight injuries from 2000 to 2010.

Good progress has been made towards achieving the targets during the period of Kent's first LTP and the Council will continue to tackle road safety through measures centered on enforcement, education and engineering.

4.2.3 Congestion

At a County level, increasing congestion is seen as a major problem and the private car is seen as the dominant mode of travel. The Council aim to reduce congestion through means such as network management, smarter travel choices, promoting cycling, walking and public transport trips, modal integration, and ultimately reducing the need to travel.

4.2.4 Freight

The Council supports the Sustainable Distribution of Goods, stating that it is vital in achieving the shared priorities of less congestion and pollution and better road safety. The Council will work with partners to ensure that road freight operations are undertaken with minimal social and environmental impact.

Where practical, the Council will:

- identify and signpost heavy transport and HGV routes to direct road haulage vehicles away from rural, residential and environmentally sensitive areas;

- discourage through traffic, particularly goods vehicles, from traveling on minor roads by the use of traffic management and regulatory measures and the control of development and freight quality partnerships; and

- promote a web-based Kent Lorry Route Map as a definitive guide to road based freight routes in the County and ensure that the map is revised accordingly to include up to date highway and land use developments.

It should be noted that the A20 between Junction 11 of the M20 and the application site is part of a signed advisory lorry route for vehicles accessing Lympne Industrial Estate.

4.2.5 A20 / M20 Primary Routes

The M20 is the primary route of access to the cross-channel ports of Folkestone and Dover.

The LTP identifies that there exists a problem caused by many lorry drivers parking in the County overnight due to a relatively small number of official parking sites available.

Furthermore, the Council states that Operation Stack can severely disrupt both the strategic road network and the County's local road network. Operation Stack is controlled by Kent Police and operates during periods of disruption to cross-channel services. Phase 1 of the operation involves closing the coastbound carriageway of the M20 between Junctions 11 and 12 to provide a temporary parking area for cross channel lorries, with all other coastbound traffic diverted onto the A20 via Junction 11. When the M20 J11-J12 becomes full, the coastbound carriageway between J8-J9 is also used for lorry parking.

The application site is located on the A20 between J10-J11; the corresponding motorway section remains open at all times during Operation Stack.

4.3 Existing Highway Network

The existing highway network within the vicinity of the application site is illustrated on Drawing 1 and is described below.

The existing site access is a simple priority junction with kerbed radii of approximately 9m. The A20 through the junction is approximately 7.5m wide and is relatively straight on approach offering good forward visibility. A footpath, around 1.5m in width, is located on the southern side of the A20. Behind the footpath are soft verges and a screening mound containing vegetation. The presence of the footpath and verges provide adequate visibility to both left and right, although both splays require a degree of reinstatement, mainly comprising the trimming / removal of vegetation.

The site access road is narrow at approximately 5.5m and the junction bellmouth can accommodate just one turning HGV. Directly opposite the junction is access to the 'Airport Café' and a car breakers / scrap yard. The access is of an informal nature and comprises separate entrance / exit points located on either side of the bellmouth opposite.

The A20 is a typical rural A-class single carriageway road, generally 7.5m wide and subject to the national speed limit. A footpath adjoins the southern side of the A20 between Sellindge and Newingreen; no lighting is present outside of these villages

Proceeding east, sporadic development is located between the site access and the village of Newingreen. The development primarily consists of farms and large detached houses which are set back from the carriageway. Within Newingreen, the housing density increases and approximately 20 dwellings adjoin the carriageway to the south. Around half of the dwellings have direct access to the A20, the rest access a slip road which rationalises movements to and from the A20. The dwellings are set back approximately 20m from the carriageway edge. A priority junction with right turn lane provides access to the A261 in the direction of Hythe.

Continuing east, no development adjoins the A20 between Newingreen and Junction 11 of the M20. The carriageway remains at approximately 7.5m wide with soft verges and is subject to the national speed limit. A roundabout of approximately 70m inscribed circle diameter (ICD) is located approximately 400m to the south of Junction 11. North of this

roundabout the A20 becomes a two lane carriageway before reaching a grade separated junction which provides full turning movements to and from the M20.

To the west of the site access, a priority junction with right turn lane provides access to Otterpool Lane, on which Lympne Industrial Estate is located. The A20 between Junction 11 of the M20 and Otterpool Lane is a signed advisory lorry route for vehicles accessing the industrial estate. Continuing west, the A20 passes through Barrowhill and Sellindge where residential development and footways adjoin the carriageway. A 40mph speed limit applies through Sellindge and automatic traffic signals control one-way traffic flow as the A20 passes beneath a rail bridge. The bridge is subject to a height limit of 4.7m.

To the west of Sellindge, the A20 proceeds towards Ashford and Junction 10 of the M20, located approximately 10km from the application site. Sporadic development adjoins the A20 and a large Tesco supermarket is accessed from a roundabout located immediately prior to Junction 10. The grade separated interchange provides access to and from the eastbound carriageway of the M20, and access from westbound carriageway. Access to the westbound carriageway is achieved by travelling northwest on the A292 and entering a slip road via a priority junction with right turn lane. The A292 proceeds into Ashford.

4.4 Sustainable Access

4.4.1 Bus Services

Stagecoach service 10/10A operates between Folkestone and Ashford via Sellindge and Newingreen. The service does not pass the application site, but is routed through Lympne via Stone Street, Aldington Street and Otterpool Lane. The nearest bus stops to the application site and used by this service are located on the A20 at Newingreen and Sellindge, the locations of which are shown on Drawing 1. A footway adjoining the A20 between Sellindge and Newingreen provides a pedestrian route from both bus stops to the application site.

The 10/10A operates an hourly service, Mondays to Saturdays. Buses depart Folkestone between 06:05 and 18:05. In the opposite direction, buses depart Ashford between 07:07 and 18:30.

4.4.2 Cycle Route Network

Details of cycling facilities located within the vicinity of the application site were obtained from Sustrans and are illustrated on Drawing 1.

There are no dedicated cycling facilities within the vicinity of the application site. A signed on-road cycle route runs between Lympne and Junction 11 of the M20. The route joins the A20 from Stone Street at Newingreen and proceeds north on the A20.

4.4.3 Summary

The overall accessibility of the application site via sustainable modes is considered poor. There do exist hourly bus services to Newingreen and Sellindge but only the most dedicated of public transport users and walkers are likely to use those services. The majority of staff are therefore likely to access the site by car and consideration is given to methods to reduce single person car journeys later within this assessment.

4.5 Existing Traffic Flows

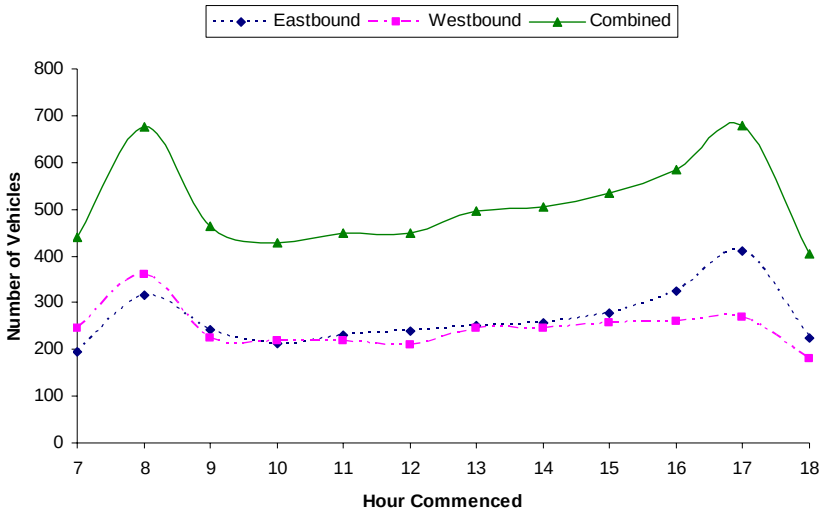
As part of this assessment, SLR Consulting commissioned a seven day Automatic Traffic Count (ATC) and speed survey on the A20 at the site access location. The count was undertaken by The Paul Castle Consultancy and commenced on Wednesday 10th October 2007.

The count data are included in Appendix 1 and a summary of average weekday flows is provided in Table 1 and Figure 1 below.

Table 1
Existing Weekday Traffic Flows (2007)

Link	Period	Two-Way Flow		
		Total	**HGV**	**%HGV**
A20	AM Peak (08:00-09:00)	676	93	13.7%
	PM Peak (17:00-18:00)	679	57	8.4%
	12-Hour (07:00-19:00)	6,110	923	15.1%

Figure 1
Existing Weekday Traffic Profile



The analysis identifies that weekday traffic flows on the A20 peak significantly during the periods 08:00-09:00 and 17:00-18:00, which shall therefore be used as peak hours within this assessment.

The proportion of HGV traffic on the A20 is high at 15%, indicating the road serves as an established freight route. Lympne Industrial Estate is located on Otterpool Lane and HGV traffic accessing the estate from the east is directed on the A20 through Newingreen and past the site access.

The results of the speed survey are also provided in Appendix 1; a summary is presented in Table 2 below.

Table 2
Traffic Speed Survey Results - A20

	Average Speed (kph)	85th Percentile Speed (kph)
Westbound	70.8	84.8
Eastbound	66.8	80.0

Table 2 shows that 85th percentile speeds are 85kph.

4.6 Accidents Records

Personal injury accident data covering the five year period 1st July 2002 to 30th June 2007 were obtained from Kent County Council. In light of the fact that the vast majority of HGVs are likely to be routed east from the site access, the accident study area includes the A20 between Otterpool Lane and Junction 11 of the M20. The data received are included in Appendix 2 and accident location and severity are shown on Drawing 4.

A total of 41 personal injury accidents occurred within the accident study area during the five year period, including 33 accidents classified as slight, 5 accidents classified as serious and 3 accidents involving fatal injuries.

Drawing 4 shows that no accidents occurred at the site access location or at the entrance to the 'Airport Café'. A fatal crash involving an HGV occurred on the A20 approximately 100m east of the junction. The incident is believed to have involved two illegal immigrants who were dropped off at the side of the road and then purposely run over by the driver of the HGV causing fatal injuries to one immigrant and serious injuries to the other. The cause of this incident was clearly not related to highway conditions.

A further two fatal accidents occurred to the east of the site access. The first accident occurred on the A20 between the site access and Newingreen. The incident involved a minibus which lost control in icy conditions, crossed the carriageway and crashed into a house. The second incident occurred in Newingreen and involved a collision between a motorcycle and a car. The motorcycle rider attempted to overtake the car which was turning right from the A20 into a private driveway; the rider received fatal injuries.

A total of five accidents, including three classified as serious, were recorded at the junction of the A20 and Otterpool Lane, located approximately 200m west of the site access. Three of the accidents involved vehicles failing to give way when turning from Otterpool Lane and colliding with through vehicles on the A20. The remaining two accidents involved a rear shunt between a car and an HGV as the car slowed to turn into Otterpool Lane and a collision with an unattended vehicle in the carriageway.

Four accidents occurred at the junction of the A20, A261 (Hythe Road) and Stone Street, all classified as slight. The first accident involved a rear end shunt between two cars waiting to enter the A20 from Stone Street. The second accident involved a collision between a car turning right into Hythe Road from the A20 and a motorcycle turning left from Hythe Road onto the A20; the drivers expected each other to give way. The third accident involved a collision between 3 cars within the vicinity of the junction, no cause is provided. The final accident involved a westbound light goods vehicle losing control on the left hand bend on approach to the junction.

A further two slight accidents occurred in Newingreen at the junction of the A20 and Stone Street. The first accident involved a collision between a car turning left into Stone Street

from the A20 and a vehicle travelling south on Stone Street approaching the A20. The second accident involved a rear end shunt between a stationary car at the junction and a second car approaching from the same direction.

A total of seven accidents, all classified as slight, occurred on the A20 between Stone Street and the roundabout junction located immediately south of Junction 11. Two accidents were caused as a result of foreign drivers travelling on the wrong side of the carriageway, one being an HGV driver. One accident involved a slight injury to a pedestrian who entered the carriageway beside a parked tractor and was hit by an oncoming car. The remaining four accidents involved loss of control, rear end shunts and failure to give way when entering the carriageway from a lay-by.

Three accidents, including one classified as serious, occurred at the roundabout junction located immediately south of Junction 11. The serious accident involved a motorcycle, whose rider lost control on approach to the roundabout and fell from the vehicle. The remaining two accidents both involved failure to give way when entering the roundabout.

Thirteen accidents, including one classified as serious, occurred within the vicinity of Junction 11 of the M20. Eleven accidents occurred on, or on approach to the roundabout. Seven of those accidents, including that involving serious injury, involved rear end shunts between vehicles waiting to enter the circulatory carriageway. The other three accidents involved single vehicles losing control on the roundabout as a result of excessive speed, fog and a misjudged manoeuvre. The remaining accident involved a vehicle approaching the roundabout from the north on the B2068 and losing control in wet conditions.

The remaining two accidents which occurred within the vicinity of Junction 11 occurred on the motorway and were not specifically junction related.

4.7 TRIP GENERATION

4.7.1 Existing / Historic Trip Generation

The application site is not currently in use and generates no vehicular traffic.

As discussed above, the application site was previously operated by Tarmac Quarries as a mineral and construction materials processing facility for the purpose of asphalt and ready mixed concrete production; operations ceased around 2001. Although no data was available detailing vehicle movements from the Tarmac operation, experience of similar sites suggests that historic operations would have generated a sizeable number of HGV movements on the surrounding highway network.

4.7.2 Future Trip Generation

A description of the development proposals is provided in Section 2.2. A breakdown of anticipated imports, exports and average vehicle loads is provided in Table 3 below.

Table 3
Proposed Trip Generation

Waste Source	Imports - Annual Tonnage	Exports- Annual Tonnage	Average Load (tonnes)	Annual HGV Loads	Daily HGV Loads
		MRF			
Compacted Trade Recyclables	30,000	-	10	3,000	11
Trade Recyclables (Ro-Ro)	25,000	-	4	6,250	23
Municipal Recyclables	20,000	-	5	4,000	15
Baled Recyclables	-	67,500	20	3,375	13
Residual to Landfill	-	7,500	20	375	2
MRF Total	75,000	75,000	-	17,000	64
		AD			
Source Segregated Green and Organics	20,000	-	8	2,500	9
Compost Products	-	9,750	20	488	2
Residual to Landfill	-	500	20	25	1
AD Total	20,000	10,250	-	3,013	12
		Overall			
-	95,000	85,250	-	20,013	76

Table 3 shows that at maximum operating capacity the development proposals would generate approximately 76 HGV loads (152 movements) per weekday. This figure has been based upon 278 operational days per year (ie: 5.5 day working week minus bank holidays). As stated in Section 2.2, all weekday HGV movements would occur between the hours 07:00 to 17:00. HGV movements are likely to be evenly spread throughout the working day

and would not peak in line with traffic on the surrounding highway network. On this basis, 8 HGV loads (16 movements) per hour can be considered a fair assessment.

The development proposals would generate a small number of light vehicle movements, principally by staff and visitors. It is anticipated a maximum of 25 staff would be based on site, which including visitor movements (post, servicing, etc) would generate at most 40 light vehicle trips (80 movements) per day.

The proposed hours of operation dictate that the majority of staff arrivals / departures would occur outside the times of peak traffic flow on the surrounding highway network. However, to provide a rigorous assessment of peak hour traffic impact, 25 light vehicle arrivals have been assumed during the AM peak (08:00-09:00) and 25 light vehicle departures during the PM peak (17:00-18:00).

4.8 TRIP DISTRIBUTION / ASSIGNMENT

Wastes to both the AD and MRF operations would be imported from East Kent, primarily from the districts of Shepway, Dover and Ashford.

The application site is located approximately 3km to the west of Junction 11 of the M20, from where the M20 provides access to Ashford to the west and Folkestone and Dover to the east. It is therefore anticipated that all imports / exports, with the exception of local trips to settlements such as Sellindge, Lympne and Hythe, would access / egress the site from the east via the M20. The distribution of HGV traffic on the M20 would be approximately 67% to the east and 33% to the west.

The A20 runs parallel to the M20 to the west of the site access and provides an alternative route to Ashford. However, to minimise the impact of HGV traffic on the A20 and through the settlements of Barrowhill and Sellindge, all traffic intended for Ashford would be routed east from the site access to Junction 11.

A summary of the anticipated HGV trip distribution and assignment is provided in Table 4.

Table 4
HGV Trip Distribution

Area	Route	% of Development Traffic	HGV Movements per Day	HGV Movements per Hour
Ashford	A20 East ➔ M20 Junction 11 ➔ M20 West	33%	50	5
Folkestone / Dover	A20 East ➔ M20 Junction 11 ➔ M20 East	67%	102	11

Light vehicle movements have been based upon an even distribution at the site access.

4.9 TRIP DISTRIBUTION / ASSIGNMENT

4.9.1 Assessment of Site Access Junction

The operation of the site access junction has been assessed using TRL software PICADY 5, which is an industry standard tool used to predict capacity, queue lengths and delays at priority junctions.

The Guidance on Transport Assessment (DfT, 2007) recommends that the capacity of the local transport network be assessed for a period no less than five years after the date of registration of a planning application, which extends to ten years when considering the strategic road network. Circular 02/2007: Planning and the Strategic Road Network (DfT, 2007) provides additional guidance on assessing the capacity of the strategic road network. The document states that the assessment should generally be for a period of ten years after the date of registration of a planning application, and where the overall forecast demand through the assessment period does not exceed operating capacity, development will normally be allowed to go ahead without the need for improvements to the network.

In line with current guidance, capacity assessments have been undertaken for the years 2008 and 2018.

Baseline flows on the A20 have been modelled for growth using the TEMPRO data set for Shepway (Southeast_Version53_05/10/06_P/A) and National Road Traffic Forecasting (NRTF) medium growth rates.

The operation of the junction has been assessed for the periods 08:00-09:00 and 17:00-18:00, which are the times of peak traffic flow on the surrounding highway network.

The junction has been modelled as a priority crossroads to take account of vehicle movements at the transport café opposite. The café has two points of access on either side of the site access road; however limitations of the PICADY programme determine that the junction has been modelled as a simple crossroads. In reality, the presence of two access points creates additional capacity and therefore the model used for this assessment is considered rigorous. No detailed trip data was available for vehicles accessing the café; however, visual observations suggest that a figure of 100 movements per hour through the junction (50 in / 50 out) is robust, with an even distribution between and east and west.

Future turning movements at the site access junction are provided in Appendix 3 and the PICADY output files are included in Appendix 4. For ease of reference, the results are summarised in Table 5 below. The output indicates the estimated maximum queue lengths and the ratio of flow to capacity (RFC), which is a measure of traffic intensity at each arm.

Table 5
Site Access Capacity Assessment

Arm	AM Peak		PM Peak	
	RFC	Max Q (veh)	RFC	Max Q (veh)
2008				
Site Access	0.049	0.05	0.086	0.09
Transport Café	0.139	0.16	0.142	0.16
A20 Eastbound	0.032	0.04	0.000	0.00
A20 Westbound	0.071	0.12	0.066	0.11
2018				
Site Access	0.053	0.06	0.092	0.10
Transport Café	0.170	0.20	0.174	0.21
A20 Eastbound	0.034	0.05	0.000	0.00
A20 Westbound	0.087	0.17	0.082	0.15

The analysis demonstrates that the junction would operate adequately in the future situation, with no queuing or driver delay expected. The level of RFC generally considered acceptable for junctions is 0.850[2]; RFC values on all arms are considerably lower than this figure, indicating significant reserve capacity.

The vast majority of vehicles would approach the site from the east and therefore right turn movements into the site would be minimal. Table 5 shows no queuing is expected for traffic travelling east on the A20.

4.9.2 Sensitivity Analysis

The trip distribution used for the above assessment assumes that all HGV traffic would access / egress the site from the east and therefore turn left in / right out of the site access junction.

Although minimal HGV movements are expected from the west, the theoretical impact on junction capacity of a greater number of right turn movements into the site is assessed below. The assessment assumes an equal distribution of HGV traffic at the site access.

Turning movements are provided in Appendix 3 and the PICADY output files are included in Appendix 4. A summary of the results is provided in Table 6 below.

[2] TA23/81 'Junctions and Accesses: Determination of Size of Roundabouts and Major / Minor Junctions', from Volume 6, Section 2, Part 7 of the Design Manual for Roads and Bridges

Table 6
Site Access Capacity Assessment - Sensitivity Analysis

Arm	AM Peak		PM Peak	
	RFC	Max Q (veh)	RFC	Max Q (veh)
2008				
Site Access	0.026	0.03	0.064	0.07
Transport Café	0.140	0.16	0.143	0.17
A20 Eastbound	0.054	0.08	0.019	0.02
A20 Westbound	0.071	0.12	0.066	0.11
2018				
Site Access	0.028	0.03	0.068	0.07
Transport Café	0.171	0.20	0.175	0.21
A20 Eastbound	0.058	0.09	0.020	0.02
A20 Westbound	0.087	0.17	0.082	0.15

The analysis demonstrates that a greater proportion of right turn movements into the site would create little impact on the operation of the junction, which would continue to operate with significant spare capacity and minimal queuing on all arms.

4.9.3 Link Capacity

Anticipated future flows on the surrounding highway network are compared to baseline flows in Table 7 below.

Table 7
Projected Traffic Increases

Link		Development Flows			Total Future Flows			% Increase	
		Light	HGV	Total	Total	HGV	%HGV	Total	HGV
A20 East of Site Access	*AM Peak*	13	16	29	705	109	15.5%	4.2%	17.2%
	PM Peak	13	16	29	708	73	10.3%	4.2%	28.0%
	12-Hour	40	152	192	6,302	1,075	17.1%	3.1%	16.5%
A20 West of Site Access	*AM Peak*	13	0	13	689	93	13.5%	1.8%	0.0%
	PM Peak	13	0	13	692	57	8.3%	1.8%	0.0%
	12-Hour	40	0	40	6,150	923	15.0%	0.7%	0.0%

The analysis demonstrates that the development proposals would generate a 3% increase in 12-hour traffic flows and a 4% increase in peak hour flows, which are not considered significant.

It should be noted that the figures are based upon 100% of HGVs accessing the site from the east and all staff movements occurring during peak hours. The projected increases therefore provide a worst case assessment.

Baseline flows on the A20 are relatively low for an A-road, largely due to the presence of the M20 which runs adjacent to the A20 between Maidstone and Folkestone. The Design Manual for Roads and Bridges[3] suggests a principal single carriageway road of width 7.3m can accommodate an AADT of 23,000 vehicles before the performance of the link begins to deteriorate. The existing AADT, derived from the seven day ATC, is 6,643 vehicles. Allowing for traffic growth and development traffic, the A20 is likely to be operating at around 8,000 AADT by 2018, which is significantly below capacity.

It is therefore concluded that the development proposals would not have an adverse impact on the operation of the surrounding highway network.

Traffic flows on the A20 are increased during Operation Stack. However, the M20 between J10-J11 remains open during the operation and therefore the corresponding section of the A20 is relatively unaffected. A moderate increase in traffic flows can be expected from vehicles avoiding the motorway route altogether, although the significant reserve capacity available determines that the link would continue to operate effectively. Development traffic would have an insignificant impact on highway capacity during periods when Operation Stack is enforced.

[3] TA46/97 'Traffic Flow Ranges for use in the Assessment of New Rural Roads', from Volume 5, Section 1, Part 3 of the Design Manual for Roads and Bridges.

4.10 ENVIRONMENTAL IMPACT

4.10.1 Impact of Additional Traffic

The guidelines for the Environmental Assessment of Road Traffic (IEA, 1993) suggest two broad rules to define the need for an environmental impact analysis:

- highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); or
- sensitive areas where traffic flows will increase by 10% or more.

The area surrounding the application site and the access route to the M20 are not considered sensitive areas and therefore the 30% threshold is deemed to apply. Table 7 demonstrates that predicted traffic increases are below the impact thresholds in terms of both overall traffic levels and HGV levels. Furthermore, all HGV traffic would be routed directly onto the A20, which is part of the primary road network and an advisory lorry route.

Negligible environmental impact is therefore anticipated as a result of this application. Notwithstanding the above, further consideration is given to relevant environmental issues below.

4.10.3 Road Safety

A review of personal injury accidents recorded on the surrounding highway network over the previous five year period is presented above.

The assessment did not highlight any particular concerns regarding road safety on the main route of vehicular access to the application site. No accidents occurred at the site access location or at the entrance to the Airport Café. The site access junction would be constructed to the full requirements of the highway authority, with appropriate visibility splays provided

It should be noted that three accidents within the study area involved fatalities. Those accidents involved a deliberate hit and run, loss of control in icy conditions and a misjudged overtaking manoeuvre from a motorcyclist. The accidents cannot be directly attributed to highway conditions and there is no underlying cause for concern.

Eleven accidents occurred at the M20 Junction 11 roundabout. The majority of accidents involved rear end shunts on approach to the roundabout, which are typical of accidents at roundabout junctions and are primarily caused by driver inattention.

The large majority of HGV traffic would be routed east from the site access to access the M20 at Junction 11. As discussed in Section 3.4, there is already a significant proportion of HGV traffic on this section of the A20 and the road can be considered an established freight route. The additional traffic proposed would therefore generate negligible impact on road safety.

4.10.3 Pedestrian / Cyclist Amenity

The majority of development traffic would be routed east from the site access and would therefore avoid the settlements of Barrowhill and Sellindge. The proposed access route does pass through Newingreen where a limited number of pedestrian movements can be expected, however footways are provided within the village which proceed west to the site access.

The Airport Café located directly opposite the site access is used by motorists and is unlikely to generate any pedestrian /cyclist trips.

It is therefore concluded that the development proposals would create an insignificant impact on the amenity of pedestrians and cyclists.

4.10.4 Accessibility

The rural location of the application site and poor accessibility by public transport determines that the majority of staff and visitor trips are likely to be made by car. A maximum of 25 staff would be located on site, thereby generating a relatively low number of light vehicle movements. Notwithstanding this fact, Countrystyle Recycling Ltd would actively promote car sharing between staff.

4.10.5 Environmental Policy

Countrystyle Recycling Ltd would employ appropriate measures to ensure that waste is not deposited on to the surrounding highway network. All imports and exports would either be sheeted or enclosed within waste collection vehicles that are specifically designed to contain and transport waste.

Wherever possible, HGV drivers would be encouraged to travel east from the site access and access the M20 at Junction 11.

4.10.6 Public Rights of Way

There are no public rights of way crossing the application site or within the immediate vicinity of the site access. The development proposals would therefore have no impact on public rights of way.

4.11 CONSTRUCTION TRAFFIC

Development of the site would require imports of construction materials, machinery and plant. The construction phase would last for a temporary period of at most 6 months and all construction vehicles would access the site from the east via the A20 and M20.

The applicant would make use of a limited volume of mixed aggregate remaining on site from the Tarmac operation, which would reduce levels of construction traffic required. Vehicle numbers anticipated during the construction phase are unlikely to exceed operational levels.

4.12 MITIGATION AND RESIDUAL IMPACT

In light of the above assessment, the following measures of mitigation are proposed as part of the planning application:

- improvements to the existing site access arrangements, to the full requirements of the highway authority;
- routing of HGV traffic via the A20 East and M20, where appropriate; and
- good management practice relating to waste transfer and driver behaviour.

Overall, it is considered that the development proposals would have an insignificant residual impact in traffic and transport terms.

4.13 CONCLUSIONS

This report assesses the traffic and transport implications of proposals to develop AD and MRF facilities at a disused minerals processing site, located off the A20, Sellindge, Kent. The existing access junction would be upgraded as part of the proposals.

The development would receive wastes from East Kent and would generate approximately 152 two-way HGV movements per day, averaging around 16 movements per hour.

The application site is well located in terms of access to the strategic road network and all HGV traffic, with the exception of very local trips, would be routed east from the site access to access the M20 at Junction 11. The route passes minimal development and avoids the villages of Sellindge and Barrowhill.

The operation of the proposed access junction has been assessed. It has been demonstrated that the junction would operate with significant spare capacity in the future situation, with no queuing or driver delay expected. No capacity issues are anticipated on the surrounding highway network.

The A20 has a high proportion of HGV use and is an established freight route for vehicles travelling between the M20 and Lympne Industrial Estate. The development proposals would generate a moderate increase in HGV numbers on this link, however no significant environmental impact has been concluded.

An assessment of personal injury road traffic accidents identified no accidents within the immediate vicinity of the site access junction during the previous five years. An insignificant impact upon road safety has been concluded.

Overall, it is considered that the development proposals are acceptable in traffic and transport terms.

4.14 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Countrystyle Recycling Ltd; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

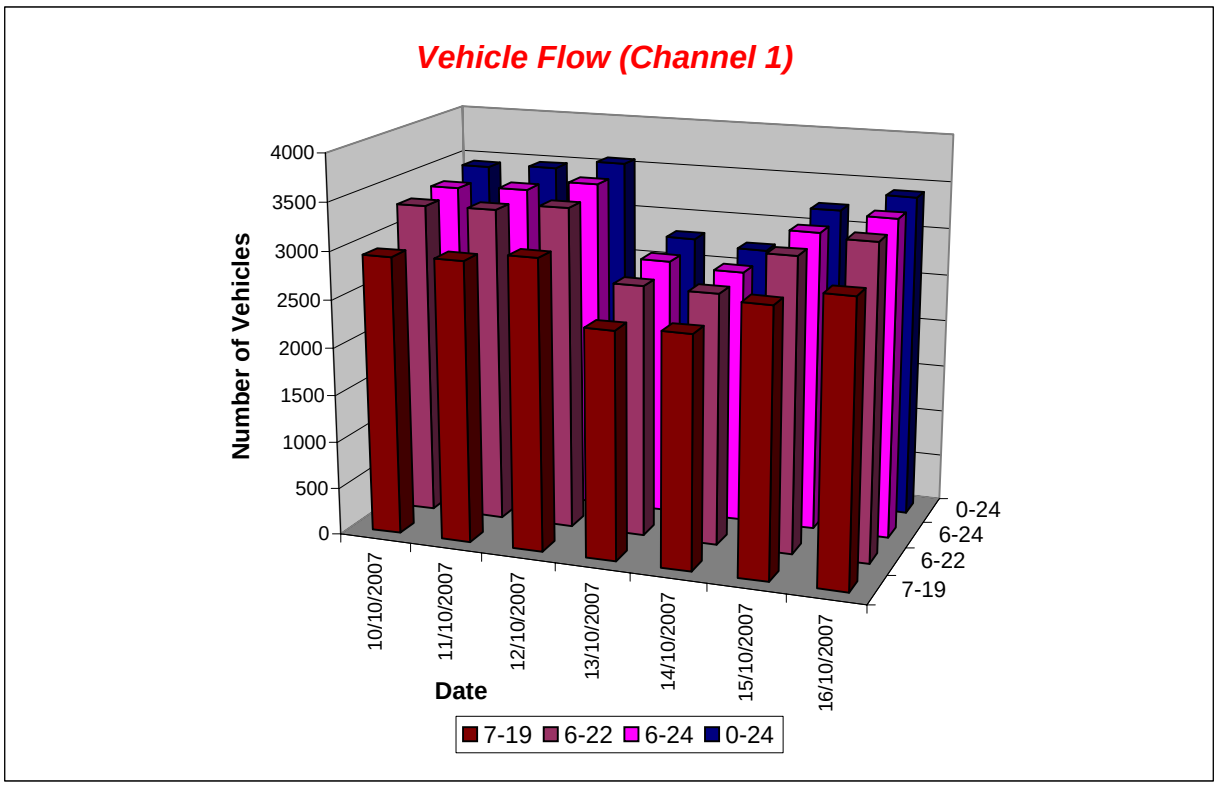
SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

A20 Sellindge ATC

Produced by The Paul Castle Consultancy

Channel 1 - Westbound **Vehicle Flow** **Week 1**

Hr Ending	10/10/2007 Wednesday	11/10/2007 Thursday	12/10/2007 Friday	13/10/2007 Saturday	14/10/2007 Sunday	15/10/2007 Monday	16/10/2007 Tuesday	5 Day Ave	7 Day Ave
1	15	10	6	24	26	9	7	9	14
2	10	14	13	13	12	8	7	10	11
3	5	11	7	6	8	5	5	7	7
4	13	5	8	6	7	5	3	7	7
5	10	15	10	9	4	5	5	9	8
6	36	37	35	14	6	40	39	37	30
7	77	77	68	35	25	82	78	76	63
8	246	245	239	93	34	255	243	246	194
9	376	368	352	120	67	325	384	361	285
10	222	203	238	179	146	227	226	223	206
11	220	208	235	247	200	189	234	217	219
12	217	218	245	259	277	219	197	219	233
13	211	226	218	278	291	185	204	209	230
14	246	264	276	269	272	218	219	245	252
15	226	237	263	205	240	258	245	246	239
16	267	238	285	187	268	253	246	258	249
17	274	267	238	228	291	253	273	261	261
18	237	278	266	193	227	265	304	270	253
19	195	209	197	134	119	139	167	181	166
20	136	128	138	107	87	105	129	127	119
21	86	83	76	78	58	58	85	78	75
22	66	69	61	39	42	57	57	62	56
23	31	37	53	45	24	42	37	40	38
24	15	26	44	37	10	26	29	28	27
7-19	2937	2961	3052	2392	2432	2786	2942	2936	2786
6-22	3302	3318	3395	2651	2644	3088	3291	3279	3098
6-24	3348	3381	3492	2733	2678	3156	3357	3347	3164
0-24	3437	3473	3571	2805	2741	3228	3423	3426	3240



A20 Sellindge ATC

Produced by The Paul Castle Consultancy

Channel 1 - Westbound **Average Speed** **Week 1**

Hr Ending	10/10/2007 Wednesday	11/10/2007 Thursday	12/10/2007 Friday	13/10/2007 Saturday	14/10/2007 Sunday	15/10/2007 Monday	16/10/2007 Tuesday
1	42.5	49.5	45.5	48.4	49.7	48.0	50.1
2	37.0	40.0	44.7	47.4	42.1	46.4	43.7
3	39.0	47.1	48.0	45.5	43.6	38.0	53.5
4	45.1	42.5	43.9	48.8	53.7	41.0	35.5
5	42.2	42.3	50.0	50.5	36.1	47.0	48.0
6	49.1	50.0	48.0	55.0	51.8	47.4	47.8
7	45.6	46.7	45.3	45.6	44.0	45.6	45.3
8	43.9	42.9	44.8	47.4	49.1	44.1	43.7
9	42.7	42.2	42.8	45.0	48.1	40.2	42.6
10	43.5	43.3	42.0	43.4	46.8	43.8	42.9
11	42.9	44.2	41.5	42.8	44.3	42.4	41.7
12	40.3	41.9	41.2	42.7	43.5	41.6	42.2
13	42.0	40.8	43.1	43.9	45.0	41.5	42.5
14	42.1	41.2	42.0	45.0	43.3	43.7	43.0
15	42.6	43.5	44.2	44.4	44.9	41.6	41.6
16	43.9	41.8	43.2	46.0	44.4	43.4	42.0
17	45.4	44.7	43.5	45.9	45.6	43.8	41.1
18	45.8	45.6	45.4	46.8	46.1	46.9	42.8
19	46.0	47.6	44.2	42.9	46.5	46.7	44.6
20	45.0	46.2	47.0	44.6	46.5	46.1	44.7
21	46.9	44.1	47.3	46.8	47.1	48.6	45.8
22	47.5	45.6	49.1	51.5	46.6	49.6	44.3
23	47.0	51.1	45.6	46.4	47.5	47.3	40.7
24	45.8	47.6	48.6	50.0	51.5	50.1	46.2
10-12	41.6	43.1	41.4	42.7	43.8	42.0	41.9
14-16	43.3	42.7	43.7	45.2	44.7	42.5	41.8
0-24	43.8	43.7	43.7	44.9	45.2	43.7	42.9

7 Day Ave	44.0

85th Percentile

Hr Ending	10/10/2007 Wednesday	11/10/2007 Thursday	12/10/2007 Friday	13/10/2007 Saturday	14/10/2007 Sunday	15/10/2007 Monday	16/10/2007 Tuesday
1	53.7	58.6	54.0	66.2	58.9	58.7	58.2
2	53.5	43.3	53.4	66.4	58.7	48.9	58.5
3	48.6	53.3	58.3	66.3	48.5	48.5	65.8
4	58.3	53.8	53.2	65.5	58.4	43.1	43.3
5	48.3	48.8	53.2	58.5	48.1	53.8	53.0
6	53.8	58.6	58.6	66.4	66.3	58.4	58.5
7	53.0	54.0	53.4	53.4	53.5	53.5	53.2
8	53.8	48.9	53.4	58.7	58.8	48.5	53.9
9	48.8	48.2	48.7	53.5	66.1	48.2	48.6
10	48.7	48.7	53.3	53.5	53.8	53.3	53.8
11	48.0	54.0	48.6	53.5	53.0	48.1	48.9
12	48.4	48.2	48.2	48.4	53.2	53.6	48.3
13	53.9	48.5	48.2	53.4	53.1	48.2	48.5
14	48.8	48.1	48.6	53.3	48.1	53.9	48.1
15	48.4	54.0	53.1	53.1	48.3	53.1	48.6
16	54.0	48.7	53.5	53.2	53.1	53.4	48.4
17	53.9	53.0	53.9	54.0	53.0	53.3	49.0
18	53.1	53.6	53.3	53.1	53.5	53.9	48.1
19	53.9	58.1	53.8	53.4	53.7	53.8	53.9
20	53.4	53.1	53.4	58.4	53.5	53.3	53.6
21	58.5	53.8	53.3	53.5	53.8	53.7	53.3
22	58.8	58.3	58.9	65.7	53.1	58.3	53.1
23	58.1	58.0	53.6	53.5	53.2	53.1	53.5
24	53.6	58.3	58.6	53.3	66.2	58.0	53.2
10-12	48.5	53.4	48.4	48.6	53.5	53.3	49.0
14-16	53.3	53.3	53.1	53.5	53.4	53.8	48.1
0-24	53.6	53.9	53.6	53.2	53.1	53.3	48.0

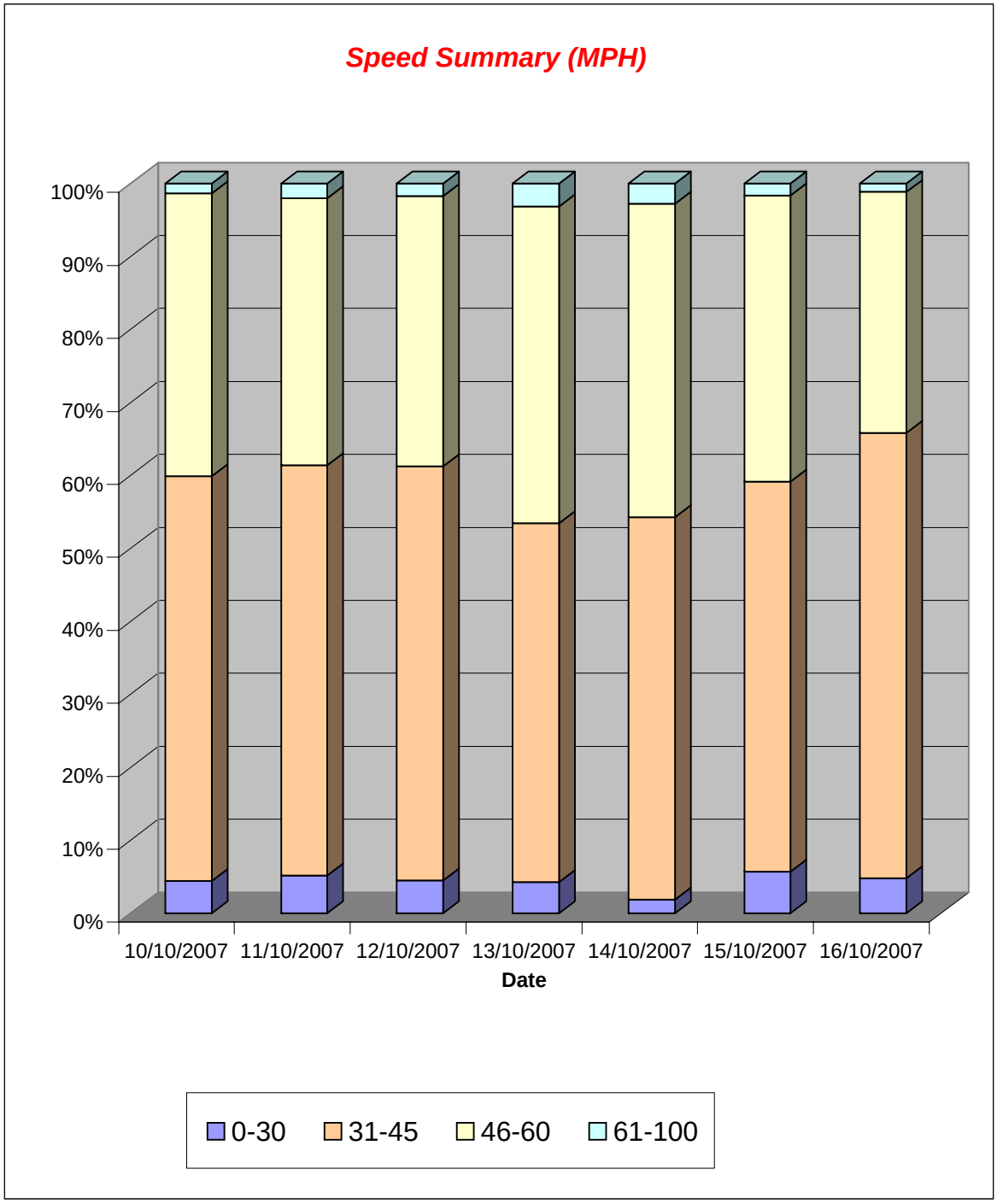
7 Day Ave	52.7

A20 Sellindge ATC

Produced by The Paul Castle Consultancy

Channel 1 - Westbound **Speed Summary** **Week 1**

Speed (MPH)	10/10/2007 Wednesday	11/10/2007 Thursday	12/10/2007 Friday	13/10/2007 Saturday	14/10/2007 Sunday	15/10/2007 Monday	16/10/2007 Tuesday
0-30	152	180	161	120	51	184	164
31-45	1906	1951	2026	1380	1437	1725	2088
46-60	1332	1271	1321	1216	1176	1266	1131
61-100	47	71	63	89	77	53	40
TOTAL	**3437**	**3473**	**3571**	**2805**	**2741**	**3228**	**3423**



A20 Sellindge ATC

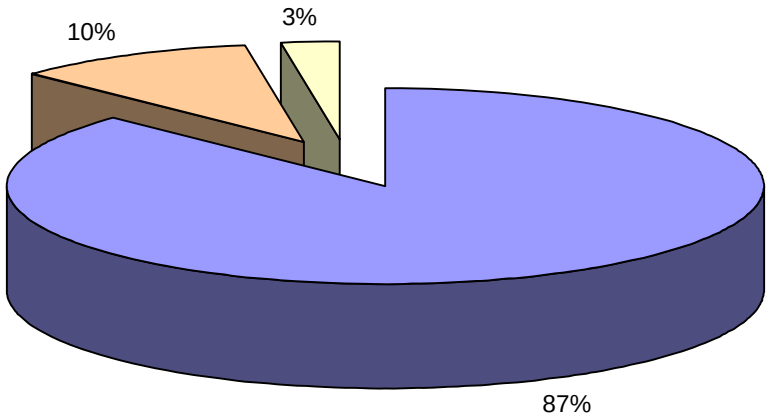
Produced by The Paul Castle Consultancy

Channel 1 - Westbound **Vehicle Class** **Week 1**

Classes / Day / Time	Car / LGV / Caravan - 1	OGV1 / Bus - 2,3,5,6,7,12	OGV2 - 4,8,9,10,11,13	TOTAL - 1-13
10/10/2007				
7-19	2498	371	68	2937
6-22	2819	401	82	3302
6-24	2859	403	86	3348
0-24	2927	412	98	3437
11/10/2007				
7-19	2509	368	84	2961
6-22	2816	399	103	3318
6-24	2872	402	107	3381
0-24	2932	419	122	3473
12/10/2007				
7-19	2613	367	72	3052
6-22	2919	391	85	3395
6-24	3005	397	90	3492
0-24	3067	401	103	3571
13/10/2007				
7-19	2206	145	41	2392
6-22	2439	167	45	2651
6-24	2515	170	48	2733
0-24	2572	176	57	2805
14/10/2007				
7-19	2341	74	17	2432
6-22	2542	83	19	2644
6-24	2572	87	19	2678
0-24	2628	93	20	2741
15/10/2007				
7-19	2373	365	48	2786
6-22	2634	388	66	3088
6-24	2690	392	74	3156
0-24	2746	399	83	3228
16/10/2007				
7-19	2514	357	71	2942
6-22	2821	380	90	3291
6-24	2876	387	94	3357
0-24	2926	395	102	3423

Average				
7-19	2436	292	57	2786
6-22	2713	316	70	3098
6-24	2770	320	74	3164
0-24	2828	328	84	3240

Total Vehicle Class Distribution



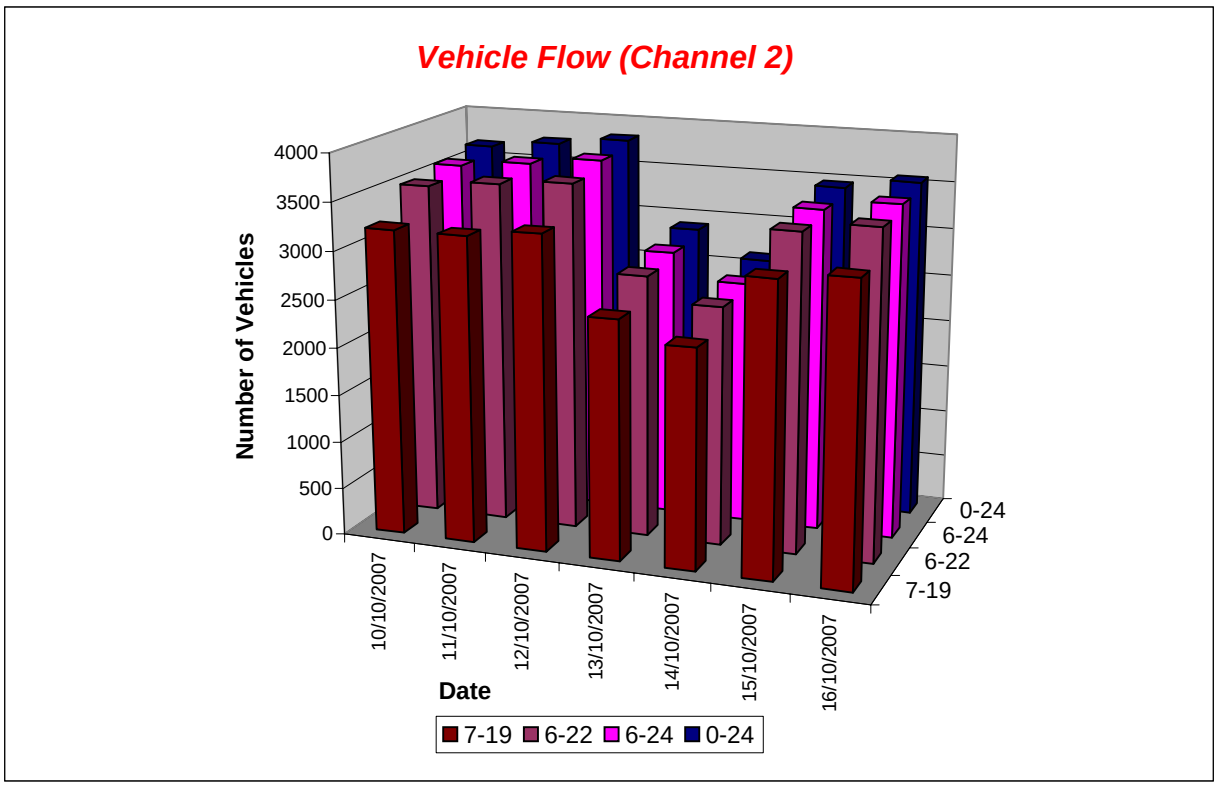
A20 Sellindge ATC

Produced by The Paul Castle Consultancy

Channel 2 - Eastbound **Vehicle Flow** **Week 1**

Hr Ending	10/10/2007 Wednesday	11/10/2007 Thursday	12/10/2007 Friday	13/10/2007 Saturday	14/10/2007 Sunday	15/10/2007 Monday	16/10/2007 Tuesday	5 Day Ave	7 Day Ave
1	12	12	7	33	38	14	16	12	19
2	10	8	12	14	7	3	6	8	9
3	6	9	6	6	10	3	9	7	7
4	8	10	11	6	8	9	7	9	8
5	10	15	17	6	2	12	7	12	10
6	31	29	27	19	9	37	28	30	26
7	69	79	65	34	23	54	72	68	57
8	198	178	211	65	60	204	180	194	157
9	343	325	310	141	68	260	339	315	255
10	219	237	245	173	122	271	236	242	215
11	234	196	220	234	163	205	205	212	208
12	218	237	255	281	197	203	235	230	232
13	242	236	258	241	269	198	261	239	244
14	279	266	240	248	257	242	224	250	251
15	233	260	300	248	293	256	241	258	262
16	283	300	274	254	266	260	271	278	273
17	306	313	351	232	251	322	325	323	300
18	417	426	383	239	210	421	398	409	356
19	240	236	246	149	138	199	199	224	201
20	103	133	140	113	82	108	116	120	114
21	61	96	82	63	45	69	66	75	69
22	67	67	63	41	60	58	63	64	60
23	62	50	64	34	39	46	50	54	49
24	16	26	38	35	13	16	22	24	24

7-19	3212	3210	3293	2505	2294	3041	3114	3174	2953
6-22	3512	3585	3643	2756	2504	3330	3431	3500	3252
6-24	3590	3661	3745	2825	2556	3392	3503	3578	3325
0-24	3667	3744	3825	2909	2630	3470	3576	3656	3403



A20 Sellindge ATC

Produced by The Paul Castle Consultancy

Channel 2 - Eastbound **Average Speed** **Week 1**

Hr Ending	10/10/2007 Wednesday	11/10/2007 Thursday	12/10/2007 Friday	13/10/2007 Saturday	14/10/2007 Sunday	15/10/2007 Monday	16/10/2007 Tuesday
1	36.8	42.8	46.6	48.5	38.7	42.6	43.3
2	43.5	39.2	51.1	38.5	43.7	29.7	49.2
3	38.4	36.2	43.4	45.1	43.5	28.8	36.9
4	35.2	32.2	33.4	42.6	39.2	41.9	41.9
5	34.8	26.8	31.5	39.7	53.0	31.1	31.9
6	41.5	39.1	45.0	38.0	45.8	35.1	41.6
7	43.1	42.5	39.0	43.6	42.6	40.3	42.8
8	42.5	41.4	40.9	42.1	43.7	40.1	42.2
9	40.1	40.8	39.7	42.5	44.2	39.4	40.1
10	41.3	40.6	39.4	40.3	42.9	39.0	40.5
11	39.8	40.6	38.7	40.0	44.7	38.7	39.2
12	39.3	40.0	39.2	40.3	43.8	37.9	38.6
13	38.6	39.5	40.1	41.0	43.1	39.3	38.6
14	39.1	39.5	41.2	40.8	43.5	39.8	41.0
15	39.7	39.8	41.4	43.0	42.4	37.8	39.9
16	40.3	41.1	41.5	43.7	42.7	41.7	40.9
17	42.1	41.7	41.2	43.3	42.1	41.4	41.6
18	41.0	41.9	44.2	42.8	42.0	41.8	42.0
19	43.0	42.8	42.7	45.2	44.4	42.8	42.2
20	44.0	44.7	45.7	45.7	44.3	45.3	42.7
21	43.5	45.2	46.1	46.0	45.1	45.4	42.5
22	43.9	44.1	46.7	47.7	42.2	48.0	43.4
23	43.8	43.2	45.9	44.9	42.5	43.5	42.9
24	42.8	45.2	43.7	42.7	38.8	47.7	41.8
10-12	39.5	40.3	39.0	40.2	44.2	38.3	38.9
14-16	40.0	40.5	41.4	43.3	42.6	39.8	40.4
0-24	40.9	41.2	41.5	42.4	43.1	40.5	40.9

7 Day Ave	41.5

85th Percentile

Hr Ending	10/10/2007 Wednesday	11/10/2007 Thursday	12/10/2007 Friday	13/10/2007 Saturday	14/10/2007 Sunday	15/10/2007 Monday	16/10/2007 Tuesday
1	53.3	53.3	66.2	66.1	48.2	58.6	53.8
2	48.5	53.3	66.0	53.3	48.2	38.8	65.8
3	58.9	53.2	58.6	53.1	53.3	38.5	43.7
4	48.5	43.5	48.2	58.2	48.8	48.2	65.9
5	43.4	38.2	58.5	58.1	58.1	48.9	48.8
6	53.8	53.6	58.7	53.4	53.5	48.4	58.7
7	53.8	48.4	53.8	59.0	53.8	53.3	53.4
8	48.7	48.9	48.4	53.5	53.8	48.8	53.1
9	48.7	48.5	48.9	53.5	53.3	48.2	48.4
10	49.0	48.2	48.7	49.0	54.0	48.4	48.3
11	48.3	48.7	48.1	48.2	53.8	48.2	48.7
12	48.5	48.7	48.6	48.4	53.7	48.9	48.3
13	48.4	48.6	48.7	48.4	48.9	48.6	48.8
14	48.7	48.8	48.0	48.3	53.9	48.4	48.2
15	48.2	48.2	48.4	48.5	48.4	48.4	48.6
16	48.4	48.8	48.4	53.1	48.1	48.9	49.0
17	48.5	48.2	48.3	53.5	49.0	48.6	48.2
18	48.8	49.0	54.0	54.0	48.8	48.9	48.9
19	48.5	53.1	48.8	53.6	53.7	48.5	48.1
20	53.4	53.1	53.7	53.9	53.4	53.3	49.0
21	53.5	53.8	53.4	53.7	53.0	53.9	48.6
22	53.2	53.4	53.7	53.4	53.2	65.8	53.6
23	53.6	53.5	53.3	58.7	53.2	53.3	48.9
24	53.5	53.1	48.4	53.1	58.5	58.2	53.6
10-12	48.7	48.1	48.4	48.8	53.4	48.3	48.2
14-16	48.9	48.2	48.9	53.7	48.1	48.0	48.9
0-24	48.4	48.0	48.1	53.5	53.3	48.7	48.1

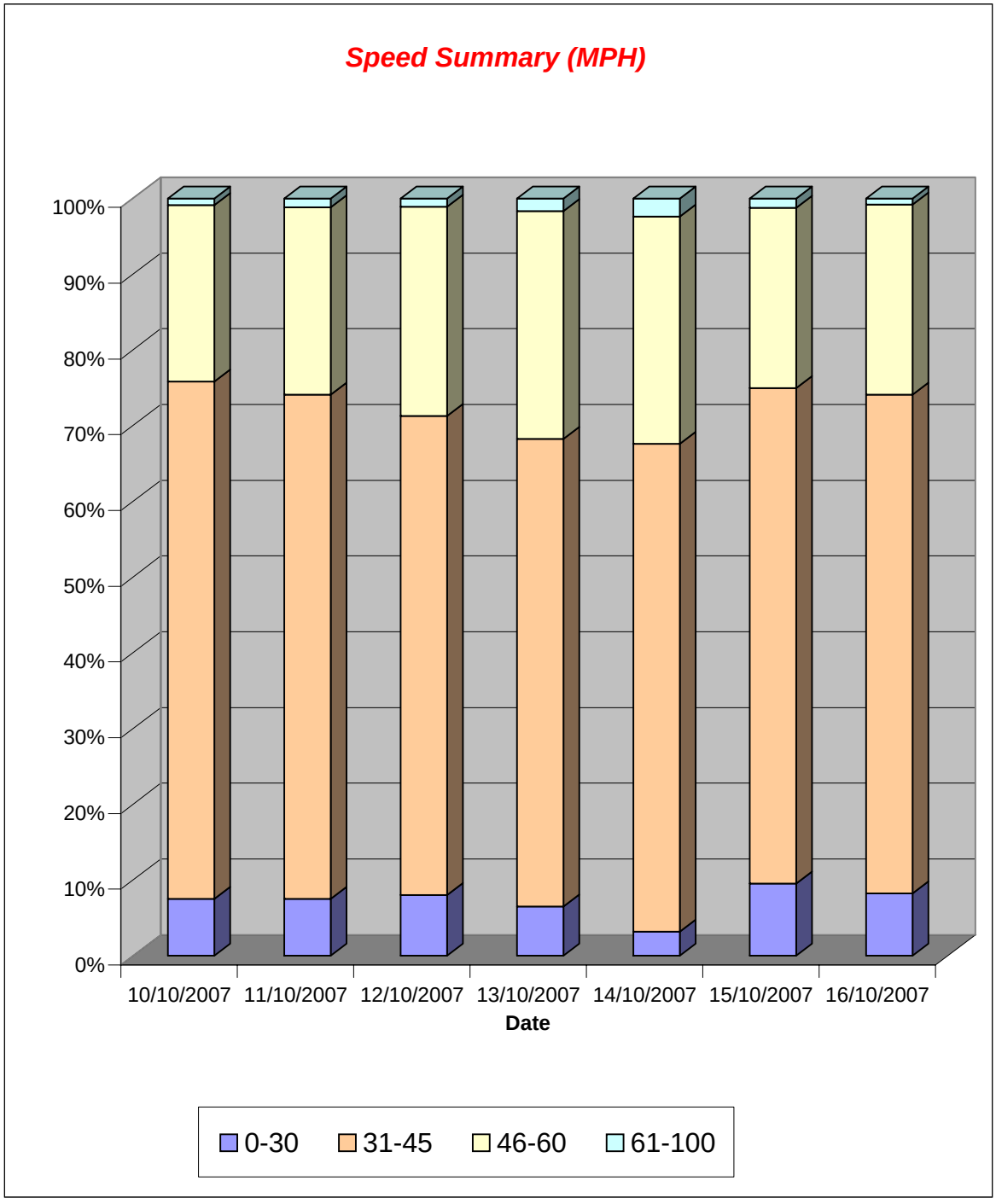
7 Day Ave	49.7

A20 Sellindge ATC

Produced by The Paul Castle Consultancy

Channel 2 - Eastbound **Speed Summary** **Week 1**

Speed (MPH)	10/10/2007 Wednesday	11/10/2007 Thursday	12/10/2007 Friday	13/10/2007 Saturday	14/10/2007 Sunday	15/10/2007 Monday	16/10/2007 Tuesday
0-30	275	282	306	190	84	331	296
31-45	2505	2491	2419	1796	1693	2270	2353
46-60	854	927	1057	874	790	825	897
61-100	33	44	43	49	63	44	30
TOTAL	**3667**	**3744**	**3825**	**2909**	**2630**	**3470**	**3576**



A20 Sellindge ATC

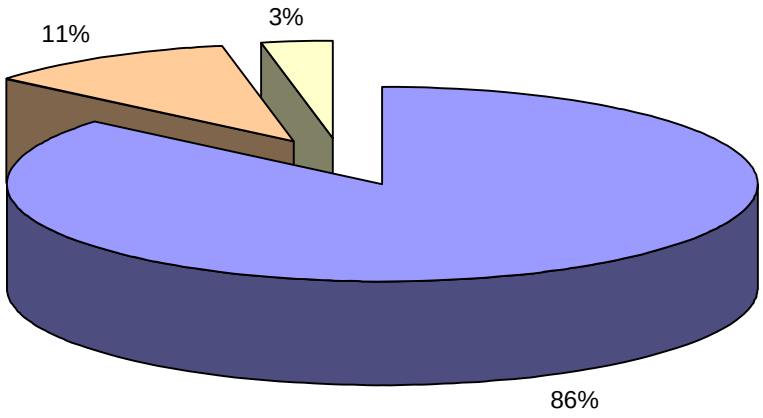
Produced by The Paul Castle Consultancy

Channel 2 - Eastbound **Vehicle Class** **Week 1**

Classes / Day / Time	Car / LGV / Caravan - 1	OGV1 / Bus - 2,3,5,6,7,12	OGV2 - 4,8,9,10,11,13	TOTAL - 1-13
10/10/2007				
7-19	2692	422	98	3212
6-22	2952	446	114	3512
6-24	3024	449	117	3590
0-24	3068	463	136	3667
11/10/2007				
7-19	2755	381	74	3210
6-22	3081	412	92	3585
6-24	3142	418	101	3661
0-24	3186	438	120	3744
12/10/2007				
7-19	2787	439	67	3293
6-22	3093	467	83	3643
6-24	3184	475	86	3745
0-24	3235	484	106	3825
13/10/2007				
7-19	2309	159	37	2505
6-22	2544	173	39	2756
6-24	2606	179	40	2825
0-24	2672	191	46	2909
14/10/2007				
7-19	2151	112	31	2294
6-22	2339	125	40	2504
6-24	2387	126	43	2556
0-24	2454	131	45	2630
15/10/2007				
7-19	2546	408	87	3041
6-22	2786	436	108	3330
6-24	2837	441	114	3392
0-24	2881	453	136	3470
16/10/2007				
7-19	2647	373	94	3114
6-22	2922	398	111	3431
6-24	2989	401	113	3503
0-24	3035	411	130	3576

Average				
7-19	2555	328	70	2953
6-22	2817	351	84	3252
6-24	2881	356	88	3325
0-24	2933	367	103	3403

Total Vehicle Class Distribution



Appendix 2

D-PRINT CRASH REPORT

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
16	**Road No A20 Grid 610906E** **Section 441 Ref 136900N**	SLIGHT	18/12/2004	Sat	08:15	L NSL	Wet/Damp	Fine		S.VEH	
	A20 APP 200M NORTH J/W OTTERPOOL LANE,SELLINGE								Shepway		
	VEH1 TRAV NORTH A20,LOST CONTROL ON O/S BEND AND LEFT RD TO N/S						Veh1, Car, SE -> N				Casualties 1 Vehicles 1
17	**Road No A20 Grid 610911E** **Section 441 Ref 136878N**	SLIGHT	17/12/2005	Sat	17:20	DRK NSL	Dry	Fine			
	A20 BARROW HILL 150 METRES NORTH OF OTERPOOL LANE, SELLINGE, KENT								Shepway		
	VEH 1 BRAKED HARD LOSING CONTROL OF THE VEHICLE, VEH 1 HAS THEN SWERVED ONTO THE WRONG SIDE OF THE ROAD AND IMPACTED WITH VEH2 CAUSING VEH 2 TO SPIN ROUND AND END UP FACING IN THE OTHER DIRECTION OF TRAVEL ON OTHER SIDE OF THE ROAD						Veh1, Car, S -> N Veh2, Car, N -> S				Casualties 3 Vehicles 2
18	**Road No A20 Grid 611033E** **Section 442 Ref 136751N**	SERIOUS	16/05/2003	Fri	15:00	L NSL	Wet/Damp	Rain		R.TURN	
	A20 J/W OTTER POOL LANE B2067								Shepway		
	VEH1 COMING OUT OF DRIVEWAY VEH2 TRAV ON A20 VEH1 PULLED OUT IN FRONT OF VEH2 VEH2 DROVE INTO VEH1						Veh1, Car, N -> W Veh2, Car, N -> E				Casualties 2 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

3-Oct-2007
16:39:42

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
19	**Road No A20 Grid 611033E** **Section 442 Ref 136754N**	SLIGHT	26/10/2005	Wed	23:45	DRK NSL	Dry	Fine		R.TURN +VE	
	A20 AT JUNCTION WITH OUTERPOOL LANE, SELLINDGE, KENT								Shepway		
	VEH 2 WAS TRAVELLING NORTH ALONG A20 TOWARDS SELLINDGE. AS HE PASSED THE OUTERPOOL LANE JUNCTION HE WAS HIT ON THE NEARSIDE OF HIS VEHICLE BY A CAR PULLING OUT OF OUTERPOOL LANE. VEH 2 WAS CAUSED TO SPIN TWICE. BOTH VEHICLES NOT DRIVAB;E. POLICE ATTENDED. DRIVER 1 PROVIDED SPECIMIN OF BREATH.						Veh1, Car, W -> S Veh2, Car, S -> N				Casualties 1 Vehicles 2
20	**Road No A20 Grid 611035E** **Section 442 Ref 136761N**	SERIOUS	01/07/2003	Tue	16:45	L NSL	Dry	Fine		R.TURN	M/C
	A20 ASHFORD ROAD J/W OTTERPOOL LANE B2062, SELLINDGE								Shepway		
	V1 FAILED TO GIVE WAY AND DROVE INTO PATH V2						Veh1, M/cycle<125, S -> E Veh2, Car, E -> W				Casualties 1 Vehicles 2
21	**Road No A20 Grid 611036E** **Section 442 Ref 136760N**	SLIGHT	07/12/2006	Thu	15:15	L NSL	Wet/Damp	Rain			HGV
	A20 ASHFORD ROAD, OTTERPOOL LANE, SELLINDGE, KENT								Shepway		
	VEHICLE TWO TRAVELLING ON THE A20 ASHFORD ROAD IN THE DIRECTION OF ASHFORD SLOWED ON APPROACH TO OTTERPOOL LANE AND INDICATED VEHICLE ONE APPROACHED FROM BEHIND AND FAILED TO SEE INDICATION UNTIL THE LAST MINUTE VEHICLE ONE BRAKED AT THE LAST MOMENT AND HIT VEHICLE TWO IN THE REAR						Veh1, Goods 3.5-7.5, E -> N Veh2, Car, E -> N				Casualties 4 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

3-Oct-2007
16:39:42

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
22	**Road No A20 Grid 611037E** **Section 442 Ref 136755N**	SERIOUS	31/10/2004	Sun	00:10	DRK STL	Dry	Fog Mist			
	A20 BARROW HILL J/W OTTERPOOL LANE 500M AWAY B2067								Shepway		
	VEH2 PARKED AND UNATTENDED ALONG BARROW HILL,VEH1 HIT VEH 2 HEAD ON,PUSHED IT ACROSS C/WAY TO OTHER SIDE OF RD						Veh2, Car, P -> P Veh1, Car, SE -> NW				Casualties 1 Vehicles 2
23	**Road No A20 Grid 611435E** **Section 444 Ref 136656N**	FATAL	08/10/2006	Sun	07:30	L NSL	Dry	Fine	U U	S.VEH	HGV
	OUTSIDE THE AIROPORT CAFE, A20, ASHFORD ROAD, LYMPNE, HYTHE (GRID REF PROVIDED)								Shepway		PED
	IT IS BELIEVED THAT TWO ILLEGAL IMMIGRANTS WERE DROPPED OFF AT THE SIDE OF THE ROAD BY AN UNKNOWN LGV. IT WOULD APPEAR THAT V1 THEN, FOR REASONS UNKNOWN AT THIS STAGE, RAN OVER BOTH CASUALTIES CAUSING FATAL INJURIES TO ONE AND SERIOUS INJURIES TO THE OTHER.						Veh1, Goods>7.5, SE -> NW				Casualties 2 Vehicles 1
24	**Road No A20 Grid 611701E** **Section 445 Ref 136659N**	SLIGHT	21/02/2006	Tue	05:39	DRK NSL	Wet/Damp	Snow			GV
	A20 ASHFORD ROAD, NEWINGREEN, HYTHE, KENT MAPPED TO REF 28/03/06								Shepway		
	V1 GERMAN VAN DRIVER MOMENTARILY FORGOT WHICH SIDE OF THE ROAD HE WAS DRIVING ON AND COLLIDEDWITH V2. WEATHER CONDITIONS BAD, HEAVY SLEET AND SNOW SHOWERS, VISIBLY POOR. ROAD WET AND SLIPPERY.						Veh1, Goods<3.5T, W -> E Veh2, Car, E -> W				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

3-Oct-2007
16:39:42

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
25	**Road No A20 Grid 612070E** **Section 446 Ref 136564N**	SLIGHT	22/05/2007	Tue	13:00	L STL	Dry	Fine		R.TURN	GV
	A20, ASHFORD ROAD, NEWINGREEN, KENT								Shepway		
	VEHICLE 3 WAS WAITING TO TURN RIGHT FROM A20 INTO NEWINGREEN NURSERYS (CYDONIA). VEHICLE 2 HAD STOPPPED BEHIND VEHICLE 3, VEHICLE 3 PULLED ACROSS ROAD AND VEHICLE 2 STARTED TO PULL AWAY, VEHICLE 1 TRAVELLING IN SAME DIRECTION SUDDENLY REALISED THAT VEHICLE 2 WAS NOT MOVING VERY FAST BRAKES HARD AND COLLIDED WITH REAR OF VEHICLE 2.						Veh1, Car, N -> S Veh2, Goods<3.5T, N -> S Veh3, Car, N -> S				Casualties 1 Vehicles 3
26	**Road No A20 Grid 612111E** **Section 446 Ref 136538N**	FATAL	15/01/2004	Thu	06:00	DRK NSL	Frost/Ice	Fine		S.VEH	
	A20 ASHFORD ROAD (MAPPED TO REF)								Shepway		
	ROAD COVERED IN ICE, V1 LOST CONTROL, CROSSED OTHER C/WAY AND CRASHED INTO HOUSE						Veh1, Minibus, NW -> S				Casualties 1 Vehicles 1
27	**Road No A20 Grid 612642E** **Section 449 Ref 136190N**	FATAL	24/04/2005	Sun	11:40	L STL	Dry	Fine		O/TAKE R.TURN	M/C
	A20, ASHFORD ROAD, NEWINGREEN, HYTHE,KENT. 100 M WEST OF A261 HYTHE ROAD								Shepway		
	VEHICLE 1 TRAVELLING SLOWLEY ALONG ASHFORD ROAD, VEHICLE 2 BEGAN TO OVERTAKE VEHICLE 1, VEHICLE 1 TURNED RIGHT INTO PATH OF ONCOMING VEHICLE 2 CAUSING RIDER TO BRAKE AND DROP VEHICLE , VEHICLE 1 AND 2 THEN COLLIDED,, RIDER OF VEHICLE RECIEVED FATAL INJURIES.						Veh1, Car, W -> S Veh2, M/cycle>125, E -> W				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

3-Oct-2007
16:39:42

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
28	**Road No A20 Grid 612719E** **Section 450 Ref 136188N**	SLIGHT	10/03/2005	Thu	18:00	DRK STL	Wet/Damp	Fine			
	ASHFORD ROAD, NEWING GREEN, KENT.								Shepway		
	V3,V2,V1 ALL TRAVELLING IN THE SAME DIRECTION ON A20, TOWARDS SELLINDGE. V3 STOPPED OUTSIDE "HOLDAY EXTRAS" TO ALLOW A VEHICLE TO TURN RIGHT FROM INFRONT OF HIM INTO "HOLIDAY EXTRAS", V2 PULLED UP QUICKLY BEHIND VEHICLE 3. DRIVER OF V2 COULD SEE V1 APPROACHING FROM BEHIND. V1 STRUCK V2 IN THE REAR, CAUSING V2 TO COLLIDE WITH V3.						Veh1, Car, E -> W Veh2, Car, E -> W Veh3, Car, E -> W			Casualties 2 Vehicles 3	
29	**Road No A20 Grid 612754E** **Section 450 Ref 136193N**	SLIGHT	05/09/2005	Mon	07:35	L STL	Wet/Damp	Rain			
	A20, FOLKESTONE, KENT								Shepway		
	D1 STATED HE WAS STATIONARY BEHIND V2 AT THE JUNCTION OF A 20 AND STONE ST. D1 LOOKED RIGHT AND SAW AN ONCOMING VEHICLE INDICATING LEFT. V1 BEGAN TO MOVE FORWARD WHEN THEY SAW THIS HOWEVER V2 HAD NOT YET STARTED TO MOVE OFF AND V1 COLLIDED WITH V2.						Veh1, Car, E -> W Veh2, Car, E -> W			Casualties 1 Vehicles 2	
30	**Road No A20 Grid 612759E** **Section 450 Ref 136196N**	SLIGHT	09/05/2005	Mon	07:55	L STL	Dry	Fine		R.TURN	M/C
	A20 ASHFORD ROAD, AT JUNCTION WITH A261 HYTHE ROAD, HYTHE								Shepway		
	VEHICLE 1 HEADING FROM ASHFORD TO HYTHE. VEHICLE 2 HEADING FROM HYTHE TOWARDS ASHFORD. BOTH APPROACHED THEIR RESPECTIVE GIVEWAY LINES. IT WOULD APPEAR THAT BOTH EXPECTED THE OTHER TO GIVE WAY AND A COLLISION OCCURED.						Veh1, Car, W -> E Veh2, M/cycle<125, E -> N			Casualties 1 Vehicles 2	

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
31	**Road No A261 Grid 612761E** **Section 001 Ref 136190N**	SLIGHT	03/07/2005	Sun	15:15	L NSL	Dry	Fine		R.TURN	
	A261 HYTHE ROAD, PEDLINGE, KENT (MAPPED TO REF)								Shepway		
	V1 TRAVELLING NORTH TO SOUTH ALONG HYTHE ROAD, SLOWED, INDICATED TO TURN RIGHT, HIT V2 TRAVELLING NORTH ON THE SAME ROAD. THE IMPACT OF V1 AND V2 PUSHED V1 BACK INTO V3 ALSO TRAVELLING NORTH TO SOUTH ON HYTHE ROAD.						Veh1, Car, N -> W Veh2, Car, S -> N Veh3, Car, N -> S				Casualties 1 Vehicles 3
32	**Road No A20 Grid 612761E** **Section Ref 136193N**	SLIGHT	28/07/2005	Thu	20:10	L STL	Dry	Fine		S.VEH +VE	GV
	A20 ASHFORD ROAD, 25 METRES OF A261 HYTHE ROAD, NEWINGTON GREEN, HYTHE								Shepway		
	VEHICLE ONE ONLY VEHICLE INVOLVED WAS TRAVELLING A20 TOWARDS NEWINGTON FROM THE M20 WHEN THE DRIVER FAILED TO NEGOTIATE A LEFT HAND BEND, CLIPPING THE BANK AND ROLLING ACROSS THE CARRIAGEWAY. THE DRIVER WAS TREATED BY KAT BUT REFUSED TO GO TO HOSPITAL, THE DRIVER WAS THEN ARRESTED EBA AND TAKEN TO CUSTODY.						Veh1, Goods<3.5T, E -> W				Casualties 1 Vehicles 1
33	**Road No A20 Grid 612811E** **Section 451 Ref 136298N**	SLIGHT	11/06/2004	Fri	07:11	L STL	Dry	Fine			
	A20 J/W SONE STREET, NEWING GREEN								Shepway		
	V1 TURNING L ONTO STONE ST, V2 TRAV S ON STONE ST. V1 BRAKED HEAVILY &SKIDDED ACROSS C/WAY INTO V2 LANE HITTING V2 HEAD ON						Veh2, Car, N -> S Veh1, Car, SW -> N				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

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FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

3-Oct-2007
16:39:42

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
34	**Road No A20 Grid 612813E** **Section 451 Ref 136294N**	SLIGHT	07/07/2003	Mon	08:30	L STL	Dry	Fine			
	A20 ASHFORD RD J/W STONE ST								Shepway		
	VEH2 STATIONARY AT JUNC VEH1 HIT REAR OF VEH2						Veh1, Car, E -> W Veh2, Car, E -> S				Casualties 1 Vehicles 2
35	**Road No A20 Grid 612874E** **Section 452 Ref 136330N**	SLIGHT	04/02/2006	Sat	07:40	L NSL	Wet/Damp	Fine			HGV
	ASHFORD ROAD, NEWINGREEN, HYTHE (MAPPED TO REF 18/05/06)								Shepway		
	V1 WAS BEING DRIVEN BY AN ITALIAN NATIONAL DRIVER. A20 TOWARDS FOLKESTONE. THE DRIVER WAS DRIVING ON THE WRONG SIDE OF THE ROAD AND FORGOT HE WAS IN ENGLAND. DRIVER SAW AN ONCOMING VEHICLE, REALISED HIS MISTAKE SO TRIED TO RECTIFY BY MOVING TO CORRECT SIDE OF ROAD. V1 IS AN ARTIC LORRY, SO IT TOOK A WHILE TO MOVE. V2 COULD TAKE NO AVOIDING ACTION AS ARTIC WAS FULLY BLOCKING THE ROAD. V2 DROVE INTO V1'S TRAILER CAUSING EXTENSIVE DAMAGE TO V2 AND INJURY TO D2 .						Veh1, Goods>7.5, W -> E Veh2, Car, E -> W				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

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STL	*Street Lights*
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STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
36	**Road No A20 Grid 613106E** **Section 453 Ref 136572N**	SLIGHT	03/01/2005	Mon	18:25	DRK NSL	Wet/Damp	Fine		S.VEH	
	A20 ASHFORD ROAD 500M EAAST OF A261 HYTHE ROAD, NEWINGREEN FOLKESTONE								Shepway		
	VEHICLE 1 WAS TRAVELLING NORTH TOWARDS B2068 WHEN HE WAS DAZZLED BY ONCOMING LIGHTS FROM ANOTHER VEHICLE. HE BRAKED AND THE BACK END OF VEHICLE 1 SLEWED OUT CAUSING VEHCILE 1 TO SKID INTO FIELD CAUSING MINOR DAMAGE TO FENCE AND DAMAGE TO VEHICLE 1. THERE ARE NO WITNESSES TO THE ACCIDENT AND THE DRIVER OF VEHICLE 1 WAS THE ONLY ONE IN THE CAR. NO OTHER VEHICLE INVOLVED.						Veh1, Car, S -> N				Casualties 1 Vehicles 1
37	**Road No A20 Grid 613125E** **Section 453 Ref 136594N**	SLIGHT	12/02/2005	Sat	03:20	DRK NSL	Wet/Damp	Rain Wind			
	A20 ASHFORD ROAD,400M NORTH EAST OF A261 HYTHE ROAD, NEWINGREEN HYTHE								Shepway		
	VEHICLE 1 TRAVELLING SW TO NE ON A20 ON THE WRONG SIDE OF THE ROAD, COLLIDED WITH VEHICLE 2 TRAVELLING IN OPPOSITE DIRECTION. COLLISION OCCURED ON A BEND WITH WHITE LINE SYSTEM IN FORCE, NO STREET LIGHTING PRESENT, DARK CONDITIONS. VEHICLE 1 IS A FOREIGN VEHICLE BEING DRIVEN BY GERMAN NATIONAL.						Veh1, Car, SW -> NE Veh2, Car, NE -> SW				Casualties 4 Vehicles 2
38	**Road No A20 Grid 613183E** **Section 453 Ref 136618N**	SLIGHT	01/10/2003	Wed	11:13	L NSL	Dry	Fine			
	A20 ASHFORD RD 500M SW RAB B2065								Shepway		
	VEH2 PARKED AND STATIONARY VEH1 TRAV SAME WAY 35MPH HIT REAR OF VEH2 CAUSING IT TO LEAVE C/WAY AND END UP IN FIELD						Veh2, Car, P -> P Veh1, Car, SW -> NE				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

3-Oct-2007
16:39:42

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
39	**Road No M20 Grid 613323E** **Section 101 Ref 137396N**	SLIGHT	28/05/2005	Sat	14:35	L STL	Dry	Fine Wind		O/TAKE	HGV
	M20, COASTBOUND, MAPPED TO REF								Shepway		
	VEHICLE 2 WAS TRAVELLING ALONG LANE ONE, VEHICLE 1 WAS IN LANE 2 JUST BEHIND VEH 2 AND OVERTAKING IT. AS IT APPROACHED VEH 2 IT SEEMS A GUST OF WIND CAUGHT VEH 1 WHICH PUSHED IT TOWARDS LANE 1. VEH 1 STRUCK THE REAR OFFSIDE CARRIAGEWAY INTO CENTRAL BARRIER. I CAN CONFIRM THAT IT IS A VERY WINDY DAY, WIND DIRECTION SOUTH TO NORTH APPROX.						Veh1, Car, W -> E Veh2, Goods>7.5, W -> E				Casualties 2 Vehicles 2
40	**Road No A20 Grid 613371E** **Section 454 Ref 136738N**	SLIGHT	21/05/2004	Fri	11:40	L NSL	Dry	Fine			
	A20 ASHFORD RD AT WESTENHANGER,10M NE J/W HILLHURST FARM								Shepway		
	VEHS 1 AND 2 TRAV A20 TO LYMPNE,VEH2 IN FRONT OF VEH1,VEH2 STOPPED DUE TO TRAFFIC AHEAD,VEH1 FAILED TO STOP IN TIME AND HIT VEH2						Veh1, Car, E -> W Veh2, Car, E -> W				Casualties 3 Vehicles 2
41	**Road No A20 Grid 613390E** **Section 454 Ref 136753N**	SLIGHT	16/06/2004	Wed	17:20	L NSL	Dry	Fine	S	O/TAKE S.VEH	
	ASHFORD RD (A20) 300 MTRS SW J/W R/ABOUT B2068								Shepway		PED
	V1 TRAV NE ON ASHFORD RD TOWARDS B2068, SAW PK TRACTOR ON SIDE OF RD. PED WENT TO CROSS RD FROM BESIDE TRACTOR AND WAS HIT BY V1						Veh1, Car, SW -> NE				Casualties 1 Vehicles 1

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
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STL	*Street Lights*
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STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

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A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
42	**Road No A20 Grid 613402E** **Section 642 Ref 137403N**	SLIGHT	29/04/2003	Tue	18:00	L STL	Dry	Fine			
	SLIP OFF M20 JUNC11 COAST BOUND								Shepway		
	VEH2 WAITING TO ENTER R/ABOUT VEH1 CAME FROM BEHIND THOUGHT VEH2 PULLING OUT AND HIT REAR OF VEH2						Veh1, Car, W -> E Veh2, Car, W -> E				Casualties 1 Vehicles 2
43	**Road No A20 Grid 613474E** **Section 454 Ref 136809N**	SLIGHT	27/09/2004	Mon	13:30	L NSL	Dry	Fine			
	A20 NEWINGTON GREEN 200 M FROM SALTWOOD RAB (MAPPED TO REF)								Shepway		
	V1 PULLED OUT FROM LAY-BY AND COLLIDED WITH V2						Veh1, Car, E -> W Veh2, Car, E -> W				Casualties 2 Vehicles 2
44	**Road No A20 Grid 613498E** **Section 642 Ref 137397N**	SLIGHT	25/03/2003	Tue	07:05	L STL	Dry	Fog Mist		S.VEH	
	B2068 JCT 11 M20 R/ABOUT								Shepway		
	HEAVY FOG,V1 MISJUDGED RD AND CRASHED INTO BARRIER ON CENTRE ON R/ABOUT.						Veh1, Car, W -> NE				Casualties 2 Vehicles 1
45	**Road No A20 Grid 613541E** **Section 642 Ref 137408N**	SLIGHT	03/08/2003	Sun	18:33	L STL	Dry	Fine			
	M20 J11 ON THE A20 CBC SLIP OFF, STANFORD								Shepway		
	V2 PULLED OUT ONTO RAB, MISJUDGED SPEED OF CAR ON RAB AND STOPPED, V1 HIT REAR V2						Veh1, Car, SE -> NW Veh2, Car, SE -> NW				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
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STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
46	**Road No B2068 Grid 613605E** **Section 015 Ref 137521N**	SLIGHT	24/03/2004	Wed	06:25	L STL	Wet/Damp	Fine		S.VEH	
	B2068 STONE ST J/W M20 JUNC11								Shepway		
	VEH1 TRAV SOUTH ON B2068 TO JUNC11 M20 LOST CONTROL AS APPROACHED R/A/B SKID ON WET ROAD HIT O/S KERB AND OVERTURNED						Veh1, Car, NE -> S				Casualties 1 Vehicles 1
47	**Road No M20 Grid 613623E** **Section 101 Ref 137442N**	SLIGHT	09/03/2005	Wed	14:00	L STU	Dry	Fine			
	M20, STANFORD INTERCHANGE, STANFORD								Shepway		
	VEH 2 STOPPED AT SLIP ROAD JUNCTION WITH ROUNDABOUT TO ALLOW VEHICLE ON ROUNDABOUT TO PASS. VEH 1 STRUCK REAR OF VEH 2. DIVERSION IN PLACE FROM M20 ACROSS STANFORD INTERCHANGE AND BACK ONTO M20. VEHICLES TRAVELLING COASTBOUND						Veh1, Car, S -> N Veh2, Car, S -> N				Casualties 1 Vehicles 2
48	**Road No A20 Grid 613626E** **Section 642 Ref 137438N**	SLIGHT	17/11/2004	Wed	07:20	L STL	Wet/Damp	Fine		S.VEH +VE	
	B2068 RAB M20 J11 SOUTHBOUND ENTRY SLIP OF B2068, STANFORD								Shepway		
	V1 TRAVELLING TOO FAST FOR WETHER CONDITIONS, FAILED TO NEGOTIATE JUNCTION						Veh1, Car, N -> E				Casualties 1 Vehicles 1
49	**Road No A20 Grid 613634E** **Section Ref 136921N**	SERIOUS	16/09/2005	Fri	10:30	L STL	Wet/Damp	Fine		S.VEH	
	A20(B) ROUNDABOUT, STANFORD								Shepway		
	VEH1 TRAVELLING ALONG A20. LOST CONTROL ON APPROACH TO ROUNDABOUT FALLING FROM MOTORCYCLE. LARGE AMOUNT OF LOOSE CHIPPING ON ROUNDABOUT.						Veh1, Car, N -> S				Casualties 1 Vehicles 1

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
50	**Road No A20 Grid 613640E** **Section 640 Ref 136960N**	SLIGHT	08/11/2005	Tue	13:20	L STU	Dry	Fine			
	A20 STANFORD, KENT.								Shepway		
	VEH 2 ON ROUNDABOUT, VEH 1 & 3 ON A20 FROM ASHFORD TOWARDS FOLKESTONE APPROACHING ROUNDABOUT. TWO LANES ON APPROACH TO ROUNDABOUT. VEH 3 IN LANE 1, VEH 1 IN LANE 2. VEH 3 SAW VEH 2 ON ROUNDABOUT INDICATING TO GO AROUND. VEH 3 FILTERED ONTO ROUNDABOUT. VEH 2 STOPPED AS VEH 3 WAS NOW IN HIS PATH TO THE EXIT HE REQUIRED. VEH 1 ENTERED ROUNDABOUT AND HIT REAR OF STATIONARY VEH 2.						Veh1, Car, W -> E Veh2, Car, S -> N Veh3, Car, W -> E				Casualties 1 Vehicles 3
51	**Road No B2068 Grid 613655E** **Section 015 Ref 137234N**	SLIGHT	29/05/2006	Mon	11:50	L STU	Wet/Damp	Rain			
	B2068 STONE STREET, HYTHE, KENT (MAPPING PROBLEMS 21/07/06)								Shepway		
	VEHICLE TWO WAS MOVING ONTO JUNCTION 11 OF THE M20 VEHICLE ONE WAS BEHIND VEHICLE TWO AND WAS LOOKING TO THE RIGHT TO MOVE ONTO THE ROUNDABOUT, DID NOT SEE WHAT SPEED VEHICLE TWO WAS DOING, MISJUDGED IT AND COLLIDED INTO THE REAR OF VEHICLE TWO						Veh1, Car, S -> N Veh2, Car, S -> N				Casualties 1 Vehicles 2
52	**Road No A20 Grid 613672E** **Section 640 Ref 136976N**	SLIGHT	27/05/2003	Tue	16:46	L NSL	Dry	Fine		R.TURN	M/C
	ASHFORD RD J/W A20 SLIP TO M20								Shepway		
	VEH2 TRAV EAST TO FOLKESTONE WENT ROUND R/ABOUT TO GET BACK ON SAME RD VEH1 PULLED OUT AS VEH2 NOT INDICATING AND HIT VEH2						Veh1, M/cycle>125, W -> SE Veh2, Car, W -> SE				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
53	**Road No A20 Grid 613673E** **Section 641 Ref 137132N**	SLIGHT	16/04/2006	Sun	13:30	L STU	Dry	Fine			
	A20 ASHFORD ROAD, HYTHE, KENT (MAPPED TO REF)								Shepway		
	VEH 2 WAS STATIONARY AT THE GIVE WAY LINE OF A JUNCTION WAITING TO TURN LEFT. VEH 2 WAITED AT THE JUNCTION DUE TO APPROACHING TRAFFIC. VEH 1 WAS BEHIND VEH 2. VEH 1 MOVED OFF AND COLLIDED WITH THE REAR OF VEH 2 CAUSING DAMAGE AND MINOR INJURY.						Veh1, Car, E -> S Veh2, Car, E -> S				Casualties 2 Vehicles 2
54	**Road No A20 Grid 613731E** **Section 642 Ref 137382N**	SLIGHT	10/11/2002	Sun	09:30	L STL	Wet/Damp	Rain		S.VEH	
	M20 JUNCTION 11 SLIP ROD ON COASTBOUND 120 YARDS: POSTLING								Shepway		
	VEHICLE ONE HAVING NEGOTIATED ROUNDABOUT REALISED THAT HE HAD TAKEN WRONG EXIT: CHANGED HIS MIND CLIPPING KERB AND COLLIDED WITH SI						Veh1, Car, E -> W				Casualties 1 Vehicles 1
55	**Road No A20 Grid 613757E** **Section 642 Ref 137283N**	SLIGHT	20/06/2004	Sun	12:10	L STL	Dry	Fine			
	JUNC 11 B C/WAY SLIP OFF M20 AT R/ABOUT A20/B2068								Shepway		
	V2 TRAV WEST ON SLIP RD OF B C/WAY FROM M20, STOPPED TO GIVE WAY TO TRAFF ON R/ABOUT, V1 BEHIND V2 COLLIDED WITH REAR V2						Veh1, Car, E -> W Veh2, Car, E -> W				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
PSV	*Bus/Coach*

Street Lighting

L	*Daylight*
DRK	*Dark*
NSL	*No Street Lights*
STL	*Street Lights*
USL	*Street LIghts Unlit*
STU	*Street Lights Unknown*

FACTORS

+VE	*Positive Breath Test*
R.TURN	*Right Turn Manoeuvre*
O/TAKE	*Overtaking Manoeuvre*
S.VEH	*Single Vehicle*

Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

D-PRINT CRASH REPORT

A20 Ashford Road 01.07.2002 to 30.06.2007

No	Location	Severity	Date	Day	Time	Street Lighting	Road Surface	Weather	Pedestrian Direction	Factors	Involved
56	**Road No M20 Grid 613793E** **Section 101 Ref 137282N**	SERIOUS	08/03/2005	Tue	08:25	L STL	Wet/Damp	Fine			
	M20 EXIT SLIP, JUNCTION 11, FOLKESTONE. KENT.								Shepway		
	VEHICLE ONE, TWO AND THREE WERE TRAVELLING OFF THE SLIP ROAD M20, J/11 LONDON BOUND EXITING THE MOTORWAY. VEHICLES TWO AND THREE WERE HELD IN TRAFFIC, DUE TO OP STACK WAITING TO ENTER THE ROUNDABOUT, VEHICLE ONE, TRAVELLING FROM BEHIND COLLIDING WITH VEHICLE TWO, WHICH IN TURN COLLIDED WITH VEHICLE THREE, CAUSING DAMAGE AND MINOR INJURY TO DRIVER TWO, AND BROKEN COLLAR BONE TO DRIVER V ONE.ROAD WAS WET. ALL VEHICLES WERE TRAVELLING EAST TO WEST.						Veh1, Car, E -> W Veh2, Car, E -> W Veh3, Car, E -> W				Casualties 2 Vehicles 3
57	**Road No M20 Grid 613838E** **Section 101 Ref 137303N**	SLIGHT	31/10/2003	Fri	14:29	L STL	Dry	Fine		S.VEH	
	M20 B C/WAY MP 101/9								Shepway		
	VEH1 TRAV LANE3 LOST CONTROL SPUN RIGHT ROUND HIT N/S BARRIER CAME TO REST IN LANE1						Veh1, Car, E -> W				Casualties 1 Vehicles 1
58	**Road No A20 Grid 613846E** **Section 642 Ref 137274N**	SLIGHT	03/04/2003	Thu	08:30	L STU	Dry	Unknown			
	M20 JCT11 SLIP OFF MP 102/0B								Shepway		
	VEH2 STOPPED AT R/ABOUT GIVING WAY TO VEH ON RIGHT VEH1 WENT INTO REAR OF VEH2						Veh1, Car, E -> W Veh2, Car, E -> W				Casualties 1 Vehicles 2

Key

Involved

PED	*Pedestrian*
HGV	*Heavy Goods Vehicle*
GV	*Goods Vehicle*
M/C	*Motor Cycle*
P/C	*Pedal Cycle*
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Special Conditions

ATS OUT	*Traffic Lights Not Working*
ATS DEF	*Traffic Lights Defective*
SIGNS	*Road Signs Defective or Obscurred*
RD WRKS	*Road Works*
Surface	*Road Surface Defective*

Appendix 3

Site Access Junction - Peak Hour Turning Movements

Arm A	A20 East
Arm B	Site Access
Arm C	A20 West
Arm D	Café

Growth Factor (TEMPRO Shepway and NRTF Medium Growth)

2007-2008	AM	1.013
	PM	1.012
2007-2018	AM	1.152
	PM	1.155

		Existing (2007)			Existing Site		Baseline		Growth to 2008		Growth to 2018		Development Traffic			Total in 2008			Total in 2018		
		Flow	HGV	% HGV	Flow	HGV	Flow	HGV	Flow	HGV	Flow	HGV	Flow	HGV	% HGV	Flow	HGV	% HGV	Flow	HGV	% HGV
AM PEAK	A-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5	8.0	39.0%	20.5	8.0	39.0%	20.5	8.0	39.0%
(0800-0900)	A-C	361.0	44.4	12.3%	0.0	0.0	361.0	44.4	365.7	45.0	415.9	51.1	0.0	0.0	#DIV/0!	365.7	45.0	12.3%	415.9	51.1	12.3%
	A-D	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.8	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.8	2.9	10.0%
	B-A	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	8.0	100.0%	8.0	8.0	100.0%	8.0	8.0	100.0%
	B-C	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	B-D	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	C-A	315.4	48.6	15.4%	0.0	0.0	315.4	48.6	319.5	49.2	363.3	56.0	0.0	0.0	#DIV/0!	319.5	49.2	15.4%	363.3	56.0	15.4%
	C-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0%	12.5	0.0	0.0%	12.5	0.0	0.0%
	C-D	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.8	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.8	2.9	10.0%
	D-A	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.8	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.8	2.9	10.0%
	D-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	D-C	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.8	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.8	2.9	10.0%
PM PEAK	A-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	8.0	100.0%	8.0	8.0	100.0%	8.0	8.0	100.0%
(1700-1800)	A-C	270.0	24.6	9.1%	0.0	0.0	270.0	24.6	273.2	24.9	311.9	28.4	0.0	0.0	#DIV/0!	273.2	24.9	9.1%	311.9	28.4	9.1%
	A-D	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.9	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.9	2.9	10.0%
	B-A	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.5	8.0	39.0%	20.5	8.0	39.0%	20.5	8.0	39.0%
	B-C	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0%	12.5	0.0	0.0%	12.5	0.0	0.0%
	B-D	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	C-A	409.0	32.6	8.0%	0.0	0.0	409.0	32.6	413.9	33.0	472.4	37.7	0.0	0.0	#DIV/0!	413.9	33.0	8.0%	472.4	37.7	8.0%
	C-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	C-D	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.9	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.9	2.9	10.0%
	D-A	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.9	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.9	2.9	10.0%
	D-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	D-C	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.9	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.9	2.9	10.0%

2008 AM Traffic

	A	B	C	D
A		21	366	25
B	8		0	0
C	320	13		25
D	25	0	25	

2018 AM Traffic

	A	B	C	D
A		21	416	29
B	8		0	0
C	363	13		29
D	29	0	29	

% HGV

	A	B	C	D
A		39.0%	12.3%	10.0%
B	100.0%		#DIV/0!	#DIV/0!
C	15.4%	0.0%		10.0%
D	10.0%	#DIV/0!	10.0%	

% HGV

	A	B	C	D
A		39.0%	12.3%	10.0%
B	100.0%		#DIV/0!	#DIV/0!
C	15.4%	0.0%		10.0%
D	10.0%	#DIV/0!	10.0%	

2008 PM Traffic

	A	B	C	D
A		8	273	25
B	21		13	0
C	414	0		25
D	25	0	25	

2018 PM Traffic

	A	B	C	D
A		8	312	29
B	21		13	0
C	472	0		29
D	29	0	29	

% HGV

	A	B	C	D
A		100.0%	9.1%	10.0%
B	39.0%		0.0%	#DIV/0!
C	8.0%	#DIV/0!		10.0%
D	10.0%	#DIV/0!	10.0%	

% HGV

	A	B	C	D
A		100.0%	9.1%	10.0%
B	39.0%		0.0%	#DIV/0!
C	8.0%	#DIV/0!		10.0%
D	10.0%	#DIV/0!	10.0%	

Site Access Junction - Peak Hour Turning Movements (Sensitivity Analysis)

Arm A	A20 East
Arm B	Site Access
Arm C	A20 West
Arm D	Café

Growth Factor (TEMPRO Shepway and NRTF Medium Growth)

2007-2008	AM	1.013
	PM	1.012
2007-2018	AM	1.152
	PM	1.155

		Existing (2007)			Existing Site		Baseline		Growth to 2008		Growth to 2018		Development Traffic			Total in 2008			Total in 2018		
		Flow	HGV	% HGV	Flow	HGV	Flow	HGV	Flow	HGV	Flow	HGV	Flow	HGV	% HGV	Flow	HGV	% HGV	Flow	HGV	% HGV
AM PEAK	A-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	4.0	24.2%	16.5	4.0	24.2%	16.5	4.0	24.2%
(0800-0900)	A-C	361.0	44.4	12.3%	0.0	0.0	361.0	44.4	365.7	45.0	415.9	51.1	0.0	0.0	#DIV/0!	365.7	45.0	12.3%	415.9	51.1	12.3%
	A-D	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.8	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.8	2.9	10.0%
	B-A	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0	100.0%	4.0	4.0	100.0%	4.0	4.0	100.0%
	B-C	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0	100.0%	4.0	4.0	100.0%	4.0	4.0	100.0%
	B-D	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	C-A	315.4	48.6	15.4%	0.0	0.0	315.4	48.6	319.5	49.2	363.3	56.0	0.0	0.0	#DIV/0!	319.5	49.2	15.4%	363.3	56.0	15.4%
	C-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	4.0	24.2%	16.5	4.0	24.2%	16.5	4.0	24.2%
	C-D	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.8	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.8	2.9	10.0%
	D-A	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.8	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.8	2.9	10.0%
	D-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	D-C	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.8	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.8	2.9	10.0%
PM PEAK	A-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0	100.0%	4.0	4.0	100.0%	4.0	4.0	100.0%
(1700-1800)	A-C	270.0	24.6	9.1%	0.0	0.0	270.0	24.6	273.2	24.9	311.9	28.4	0.0	0.0	#DIV/0!	273.2	24.9	9.1%	311.9	28.4	9.1%
	A-D	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.9	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.9	2.9	10.0%
	B-A	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	4.0	24.2%	16.5	4.0	24.2%	16.5	4.0	24.2%
	B-C	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.5	4.0	24.2%	16.5	4.0	24.2%	16.5	4.0	24.2%
	B-D	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	C-A	409.0	32.6	8.0%	0.0	0.0	409.0	32.6	413.9	33.0	472.4	37.7	0.0	0.0	#DIV/0!	413.9	33.0	8.0%	472.4	37.7	8.0%
	C-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0	100.0%	4.0	4.0	100.0%	4.0	4.0	100.0%
	C-D	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.9	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.9	2.9	10.0%
	D-A	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.9	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.9	2.9	10.0%
	D-B	0.0	0.0	#DIV/0!	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!
	D-C	25.0	2.5	10.0%	0.0	0.0	25.0	2.5	25.3	2.5	28.9	2.9	0.0	0.0	#DIV/0!	25.3	2.5	10.0%	28.9	2.9	10.0%

2008 AM Traffic

	A	B	C	D
A		17	366	25
B	4		4	0
C	320	17		25
D	25	0	25	

2018 AM Traffic

	A	B	C	D
A		17	416	29
B	4		4	0
C	363	17		29
D	29	0	29	

% HGV

	A	B	C	D
A		24.2%	12.3%	10.0%
B	100.0%		100.0%	#DIV/0!
C	15.4%	24.2%		10.0%
D	10.0%	#DIV/0!	10.0%	

% HGV

	A	B	C	D
A		24.2%	12.3%	10.0%
B	100.0%		100.0%	#DIV/0!
C	15.4%	24.2%		10.0%
D	10.0%	#DIV/0!	10.0%	

2008 PM Traffic

	A	B	C	D
A		4	273	25
B	17		17	0
C	414	4		25
D	25	0	25	

2018 PM Traffic

	A	B	C	D
A		4	312	29
B	17		17	0
C	472	4		29
D	29	0	29	

% HGV

	A	B	C	D
A		100.0%	9.1%	10.0%
B	24.2%		24.2%	#DIV/0!
C	8.0%	100.0%		10.0%
D	10.0%	#DIV/0!	10.0%	

% HGV

	A	B	C	D
A		100.0%	9.1%	10.0%
B	24.2%		24.2%	#DIV/0!
C	8.0%	100.0%		10.0%
D	10.0%	#DIV/0!	10.0%	

Appendix 4

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

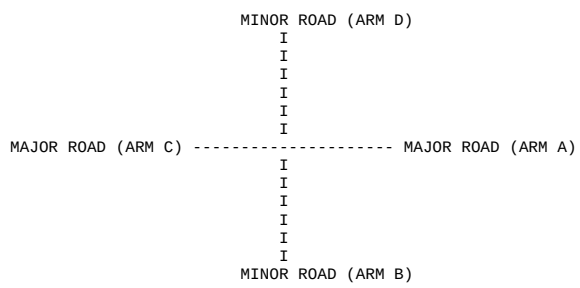
Run with file:-
"C:\TRL Files\Junction\PICADY 5\409-1376-00002 Otterpool\Scenario 1\AM Peak 2008.vpi"
(drive-on-the-left) at 13:13:11 on Thursday, 1 November 2007

.RUN INFORMATION
****

RUN TITLE: Scenario 1 - AM Peak 2008
LOCATION: A20 Site Access Junction
DATE: 01/11/07
CLIENT: Countrystyle Recycling
ENUMERATOR: mshephard [000473_LAP]
JOB NUMBER: 409.1376.00002
STATUS: TIA
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A20 East
ARM B IS Site Access
ARM C IS A20 West
ARM D IS Transport Cafe

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.00 M.	(W) 8.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.	(WA-D) 2.20 M.
- VISIBILITY	(VC-B) 200.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 12.0 M.	(VD-A) 10.0 M.
- VISIBILITY TO RIGHT	(VB-A) 10.0 M.	(VD-C) 10.0 M.
- LANE 1 WIDTH	(WB-C) -	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) -	(WD-C) 0.00 M.
- WIDTH AT 0 M FROM JUNC.	10.00 M.	-
- WIDTH AT 5 M FROM JUNC.	5.00 M.	-
- WIDTH AT 10 M FROM JUNC.	3.65 M.	-
- WIDTH AT 15 M FROM JUNC.	3.65 M.	-
- WIDTH AT 20 M FROM JUNC.	3.65 M.	-
- LENGTH OF FLARED SECTION	DERIVED: 1 PCU	

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
579.75	0.21	0.08

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D
671.24	0.24	0.09

B-A Stream

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream D-A	Slope For Opposing Stream D-B
447.53	0.19	0.19	0.19	0.19

Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C
0.07	0.12	0.27	0.09

D-C Stream

Intercept For Stream D-C	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream B-C	Slope For Opposing Stream B-D
517.47	0.22	0.22	0.22	0.22

Slope For Opposing Stream C-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream B-A
0.09	0.14	0.31	0.11

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D
689.79	0.24	0.35

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
689.79	0.24	0.35

B-D Stream From Left Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

B-D Stream From Right Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

D-B Stream From Left Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

D-B Stream From Right Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

.

.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: AM Peak 2008

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	5.15	7.73	5.15
ARM B	15.00	45.00	75.00	0.10	0.15	0.10
ARM C	15.00	45.00	75.00	4.47	6.71	4.47
ARM D	15.00	45.00	75.00	0.63	0.94	0.63

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
07.45 - 09.15					
	ARM A	0.000	0.051	0.888	0.061
		0.0	21.0	366.0	25.0
		(0.0)	(39.0)	(12.3)	(10.0)
	ARM B	1.000	0.000	0.000	0.000
		8.0	0.0	0.0	0.0
		(100.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.894	0.036	0.000	0.070
		320.0	13.0	0.0	25.0
		(15.4)	(0.0)	(0.0)	(10.0)
	ARM D	0.500	0.000	0.500	0.000
		25.0	0.0	25.0	0.0
		(10.0)	(0.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-CD	0.00	7.99	0.000		0.00	0.00	0.0		0.00
B-AD	0.10	3.47	0.029		0.00	0.03	0.4		0.30
A-BCD	0.49	12.36	0.040		0.00	0.06	0.8		0.08
A-B	0.25								
A-C	4.42								
D-ABC	0.63	7.32	0.086		0.00	0.09	1.3		0.15
C-ABD	0.24	12.66	0.019		0.00	0.02	0.3		0.08
C-D	0.31								
C-A	3.94								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-CD	0.00	7.78	0.000		0.00	0.00	0.0		0.00
B-AD	0.12	3.26	0.037		0.03	0.04	0.5		0.32
A-BCD	0.64	12.74	0.051		0.06	0.08	1.2		0.08
A-B	0.30								
A-C	5.23								
D-ABC	0.75	7.01	0.107		0.09	0.12	1.7		0.16
C-ABD	0.31	12.91	0.024		0.02	0.03	0.4		0.08
C-D	0.37								
C-A	4.69								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-CD	0.00	7.48	0.000		0.00	0.00	0.0		0.00
B-AD	0.15	2.98	0.049		0.04	0.05	0.7		0.35
A-BCD	0.95	13.44	0.070		0.08	0.12	1.8		0.08
A-B	0.36								
A-C	6.25								
D-ABC	0.92	6.58	0.139		0.12	0.16	2.3		0.18
C-ABD	0.42	13.27	0.032		0.03	0.04	0.6		0.08
C-D	0.45								
C-A	5.70								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-CD	0.00	7.48	0.000		0.00	0.00	0.0		0.00
B-AD	0.15	2.98	0.049		0.05	0.05	0.8		0.35
A-BCD	0.95	13.44	0.071		0.12	0.12	1.9		0.08
A-B	0.36								
A-C	6.25								
D-ABC	0.92	6.58	0.139		0.16	0.16	2.4		0.18
C-ABD	0.42	13.27	0.032		0.04	0.04	0.6		0.08
C-D	0.45								
C-A	5.70								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-CD	0.00	7.78	0.000		0.00	0.00	0.0		0.00
B-AD	0.12	3.26	0.037		0.05	0.04	0.6		0.32
A-BCD	0.64	12.74	0.051		0.12	0.08	1.2		0.08
A-B	0.30								
A-C	5.23								
D-ABC	0.75	7.01	0.107		0.16	0.12	1.9		0.16
C-ABD	0.31	12.91	0.024		0.04	0.03	0.5		0.08
C-D	0.37								
C-A	4.69								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-CD	0.00	7.99	0.000		0.00	0.00	0.0		0.00
B-AD	0.10	3.47	0.029		0.04	0.03	0.5		0.30
A-BCD	0.50	12.36	0.040		0.08	0.06	0.9		0.08
A-B	0.25								
A-C	4.42								
D-ABC	0.63	7.32	0.086		0.12	0.09	1.5		0.15
C-ABD	0.24	12.66	0.019		0.03	0.02	0.3		0.08
C-D	0.31								
C-A	3.94								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-CD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.1
08.45	0.1
09.00	0.0
09.15	0.0

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.1
09.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-CD	0.0	0.0	0.0	0.00	0.0	0.00
B-AD	11.0	7.3	3.5	0.32	3.5	0.32
A-BCD	62.6	41.7	7.7	0.12	7.7	0.12
A-B	27.4	18.3				
A-C	477.1	318.1				
D-ABC	68.8	45.9	11.1	0.16	11.1	0.16
C-ABD	29.2	19.4	2.8	0.10	2.8	0.10
C-D	33.6	22.4				
C-A	430.0	286.7				
ALL	1139.7	759.8	25.2	0.02	25.2	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

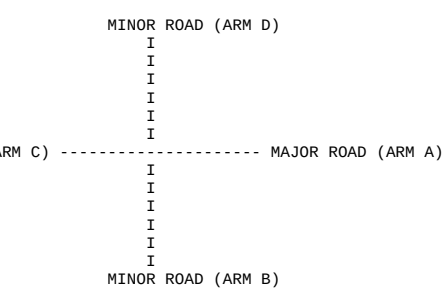
Run with file:-
"C:\TRL Files\Junction\PICADY 5\409-1376-00002 Otterpool\Scenario 1\PM Peak 2008.vpi"
(drive-on-the-left) at 13:18:23 on Thursday, 1 November 2007

.RUN INFORMATION
****

RUN TITLE: Scenario 1 - PM Peak 2008
LOCATION: A20 Site Access Junction
DATE: 01/11/07
CLIENT: Countrystyle Recycling
ENUMERATOR: mshephard [000473_LAP]
JOB NUMBER: 409.1376.00002
STATUS: TIA
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A20 East
ARM B IS Site Access
ARM C IS A20 West
ARM D IS Transport Cafe

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.00 M.	(W) 8.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.	(WA-D) 2.20 M.
- VISIBILITY	(VC-B) 200.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 12.0 M.	(VD-A) 10.0 M.
- VISIBILITY TO RIGHT	(VB-A) 10.0 M.	(VD-C) 10.0 M.
- LANE 1 WIDTH	(WB-C) -	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) -	(WD-C) 0.00 M.
- WIDTH AT 0 M FROM JUNC.	10.00 M.	-
- WIDTH AT 5 M FROM JUNC.	5.00 M.	-
- WIDTH AT 10 M FROM JUNC.	3.65 M.	-
- WIDTH AT 15 M FROM JUNC.	3.65 M.	-
- WIDTH AT 20 M FROM JUNC.	3.65 M.	-
- LENGTH OF FLARED SECTION	DERIVED: 1 PCU	

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
579.75	0.21	0.08

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D
671.24	0.24	0.09

B-A Stream

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream D-A	Slope For Opposing Stream D-B
447.53	0.19	0.19	0.19	0.19

Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C
0.07	0.12	0.27	0.09

D-C Stream

Intercept For Stream D-C	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream B-C	Slope For Opposing Stream B-D
517.47	0.22	0.22	0.22	0.22

Slope For Opposing Stream C-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream B-A
0.09	0.14	0.31	0.11

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D
689.79	0.24	0.35

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
689.79	0.24	0.35

B-D Stream From Left Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

B-D Stream From Right Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

D-B Stream From Left Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

D-B Stream From Right Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

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.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: AM Peak 2008

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	3.83	5.74	3.83
ARM B	15.00	45.00	75.00	0.43	0.64	0.43
ARM C	15.00	45.00	75.00	5.49	8.23	5.49
ARM D	15.00	45.00	75.00	0.63	0.94	0.63

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
16.45 - 18.15					
	ARM A	0.000	0.026	0.892	0.082
		0.0	8.0	273.0	25.0
		(0.0)	(100.0)	(9.1)	(10.0)
	ARM B	0.618	0.000	0.382	0.000
		21.0	0.0	13.0	0.0
		(39.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.943	0.000	0.000	0.057
		414.0	0.0	0.0	25.0
		(8.0)	(0.0)	(0.0)	(10.0)
	ARM D	0.500	0.000	0.500	0.000
		25.0	0.0	25.0	0.0
		(10.0)	(0.0)	(10.0)	(0.0)

TURNING PROPORTIONS

TURNING COUNTS (VEH/HR)

(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00										
	B-CD	0.16	9.96	0.016		0.00	0.02	0.2		0.10
	B-AD	0.26	5.11	0.052		0.00	0.05	0.8		0.21
	A-BCD	0.44	11.42	0.039		0.00	0.05	0.8		0.09
	A-B	0.10								
	A-C	3.30								
	D-ABC	0.63	7.23	0.087		0.00	0.09	1.4		0.15
	C-ABD	0.00	9.47	0.000		0.00	0.00	0.0		0.00
	C-D	0.31								
	C-A	5.19								

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15										
	B-CD	0.19	9.76	0.020		0.02	0.02	0.3		0.10
	B-AD	0.31	4.85	0.065		0.05	0.07	1.0		0.22
	A-BCD	0.57	11.64	0.049		0.05	0.07	1.1		0.09
	A-B	0.11								
	A-C	3.90								
	D-ABC	0.75	6.91	0.108		0.09	0.12	1.8		0.16
	C-ABD	0.00	9.28	0.000		0.00	0.00	0.0		0.00
	C-D	0.37								
	C-A	6.20								

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30										
	B-CD	0.24	9.47	0.025		0.02	0.03	0.4		0.11
	B-AD	0.39	4.49	0.086		0.07	0.09	1.3		0.24
	A-BCD	0.80	12.02	0.066		0.07	0.11	1.7		0.09
	A-B	0.14								
	A-C	4.68								
	D-ABC	0.92	6.45	0.142		0.12	0.16	2.4		0.18
	C-ABD	0.00	9.01	0.000		0.00	0.00	0.0		0.00
	C-D	0.46								
	C-A	7.60								

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45										
	B-CD	0.24	9.46	0.025		0.03	0.03	0.4		0.11
	B-AD	0.39	4.49	0.086		0.09	0.09	1.4		0.24
	A-BCD	0.80	12.02	0.066		0.11	0.11	1.7		0.09
	A-B	0.14								
	A-C	4.68								
	D-ABC	0.92	6.45	0.142		0.16	0.16	2.5		0.18
	C-ABD	0.00	9.01	0.000		0.00	0.00	0.0		0.00
	C-D	0.46								
	C-A	7.60								

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00										
	B-CD	0.19	9.75	0.020		0.03	0.02	0.3		0.10
	B-AD	0.31	4.85	0.065		0.09	0.07	1.1		0.22
	A-BCD	0.57	11.64	0.049		0.11	0.08	1.1		0.09
	A-B	0.11								
	A-C	3.90								
	D-ABC	0.75	6.90	0.109		0.16	0.12	1.9		0.16
	C-ABD	0.00	9.28	0.000		0.00	0.00	0.0		0.00
	C-D	0.37								
	C-A	6.20								

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15										
	B-CD	0.16	9.96	0.016		0.02	0.02	0.3		0.10
	B-AD	0.26	5.11	0.052		0.07	0.06	0.9		0.21
	A-BCD	0.45	11.43	0.039		0.08	0.06	0.8		0.09
	A-B	0.10								
	A-C	3.30								
	D-ABC	0.63	7.23	0.087		0.12	0.10	1.5		0.15
	C-ABD	0.00	9.47	0.000		0.00	0.00	0.0		0.00
	C-D	0.31								
	C-A	5.19								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-CD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.1
17.45	0.1
18.00	0.1
18.15	0.1

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.1
17.45	0.1
18.00	0.1
18.15	0.1

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.2
17.45	0.2
18.00	0.1
18.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-CD	17.9	11.9	1.9	0.10	1.9	0.10
B-AD	28.9	19.3	6.4	0.22	6.4	0.22
A-BCD	54.4	36.3	7.3	0.13	7.3	0.13
A-B	10.4	7.0				
A-C	356.4	237.6				
D-ABC	68.8	45.9	11.3	0.16	11.3	0.16
C-ABD	0.0	0.0	0.0	0.00	0.0	0.00
C-D	34.4	22.9				
C-A	569.8	379.9				
ALL	1141.1	760.7	26.9	0.02	26.9	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

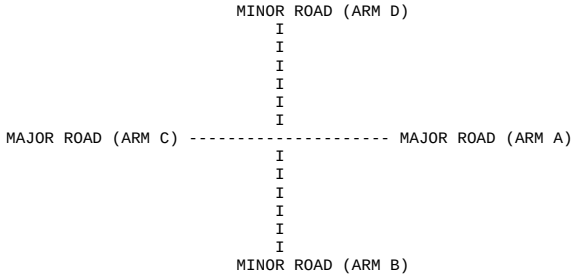
Run with file:-
"C:\TRL Files\Junction\PICADY 5\409-1376-00002 Otterpool\Scenario 1\AM Peak 2018.vpi"
(drive-on-the-left) at 13:14:53 on Thursday, 1 November 2007

.RUN INFORMATION
****

RUN TITLE: Scenario 1 - AM Peak 2018
LOCATION: A20 Site Access Junction
DATE: 01/11/07
CLIENT: Countrystyle Recycling
ENUMERATOR: mshephard [000473_LAP]
JOB NUMBER: 409.1376.00002
STATUS: TIA
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A20 East
ARM B IS Site Access
ARM C IS A20 West
ARM D IS Transport Cafe

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.00 M.	(W) 8.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.	(WA-D) 2.20 M.
- VISIBILITY	(VC-B) 200.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 12.0 M.	(VD-A) 10.0 M.
- VISIBILITY TO RIGHT	(VB-A) 10.0 M.	(VD-C) 10.0 M.
- LANE 1 WIDTH	(WB-C) -	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) -	(WD-C) 0.00 M.
- WIDTH AT 0 M FROM JUNC.	10.00 M.	-
- WIDTH AT 5 M FROM JUNC.	5.00 M.	-
- WIDTH AT 10 M FROM JUNC.	3.65 M.	-
- WIDTH AT 15 M FROM JUNC.	3.65 M.	-
- WIDTH AT 20 M FROM JUNC.	3.65 M.	-
- LENGTH OF FLARED SECTION	DERIVED: 1 PCU	

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
579.75	0.21	0.08

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D
671.24	0.24	0.09

B-A Stream

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream D-A	Slope For Opposing Stream D-B
447.53	0.19	0.19	0.19	0.19

Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C
0.07	0.12	0.27	0.09

D-C Stream

Intercept For Stream D-C	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream B-C	Slope For Opposing Stream B-D
517.47	0.22	0.22	0.22	0.22

Slope For Opposing Stream C-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream B-A
0.09	0.14	0.31	0.11

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D
689.79	0.24	0.35

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
689.79	0.24	0.35

B-D Stream From Left Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

B-D Stream From Right Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

D-B Stream From Left Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

D-B Stream From Right Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

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.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: AM Peak 2008

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	5.82	8.74	5.82
ARM B	15.00	45.00	75.00	0.10	0.15	0.10
ARM C	15.00	45.00	75.00	5.06	7.59	5.06
ARM D	15.00	45.00	75.00	0.73	1.09	0.73

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
07.45 - 09.15					
	ARM A	0.000	0.045	0.893	0.062
		0.0	21.0	416.0	29.0
		(0.0)	(39.0)	(12.3)	(10.0)
	ARM B	1.000	0.000	0.000	0.000
		8.0	0.0	0.0	0.0
		(100.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.896	0.032	0.000	0.072
		363.0	13.0	0.0	29.0
		(15.4)	(0.0)	(0.0)	(10.0)
	ARM D	0.500	0.000	0.500	0.000
		29.0	0.0	29.0	0.0
		(10.0)	(0.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-CD	0.00	7.85	0.000		0.00	0.00	0.0		0.00
B-AD	0.10	3.33	0.030		0.00	0.03	0.4		0.31
A-BCD	0.61	12.61	0.048		0.00	0.07	1.1		0.08
A-B	0.25								
A-C	4.99								
D-ABC	0.73	7.11	0.102		0.00	0.11	1.6		0.16
C-ABD	0.25	12.84	0.020		0.00	0.02	0.3		0.08
C-D	0.36								
C-A	4.47								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-CD	0.00	7.61	0.000		0.00	0.00	0.0		0.00
B-AD	0.12	3.09	0.039		0.03	0.04	0.6		0.34
A-BCD	0.85	13.19	0.064		0.07	0.11	1.6		0.08
A-B	0.29								
A-C	5.84								
D-ABC	0.87	6.76	0.129		0.11	0.15	2.1		0.17
C-ABD	0.33	13.14	0.025		0.02	0.03	0.5		0.08
C-D	0.42								
C-A	5.31								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-CD	0.00	7.28	0.000		0.00	0.00	0.0		0.00
B-AD	0.15	2.77	0.053		0.04	0.05	0.8		0.38
A-BCD	1.21	13.87	0.087		0.11	0.17	2.5		0.08
A-B	0.35								
A-C	6.99								
D-ABC	1.06	6.26	0.170		0.15	0.20	2.9		0.19
C-ABD	0.46	13.55	0.034		0.03	0.04	0.7		0.08
C-D	0.52								
C-A	6.46								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-CD	0.00	7.28	0.000		0.00	0.00	0.0		0.00
B-AD	0.15	2.77	0.053		0.05	0.06	0.8		0.38
A-BCD	1.21	13.87	0.087		0.17	0.17	2.6		0.08
A-B	0.35								
A-C	6.99								
D-ABC	1.06	6.26	0.170		0.20	0.20	3.0		0.19
C-ABD	0.46	13.55	0.034		0.04	0.05	0.7		0.08
C-D	0.52								
C-A	6.46								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-CD	0.00	7.61	0.000		0.00	0.00	0.0		0.00
B-AD	0.12	3.09	0.039		0.06	0.04	0.6		0.34
A-BCD	0.85	13.19	0.064		0.17	0.11	1.7		0.08
A-B	0.29								
A-C	5.84								
D-ABC	0.87	6.75	0.129		0.20	0.15	2.3		0.17
C-ABD	0.33	13.14	0.025		0.05	0.03	0.5		0.08
C-D	0.42								
C-A	5.31								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-CD	0.00	7.85	0.000		0.00	0.00	0.0		0.00
B-AD	0.10	3.33	0.030		0.04	0.03	0.5		0.31
A-BCD	0.61	12.62	0.048		0.11	0.07	1.1		0.08
A-B	0.25								
A-C	4.99								
D-ABC	0.73	7.11	0.102		0.15	0.12	1.8		0.16
C-ABD	0.25	12.84	0.020		0.03	0.02	0.4		0.08
C-D	0.36								
C-A	4.47								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-CD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.1
08.45	0.1
09.00	0.0
09.15	0.0

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.1
09.15	0.1

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.1
09.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-CD	0.0	0.0	0.0	0.00	0.0	0.00
B-AD	11.0	7.3	3.7	0.34	3.7	0.34
A-BCD	80.0	53.3	10.5	0.13	10.5	0.13
A-B	27.0	18.0				
A-C	534.4	356.3				
D-ABC	79.8	53.2	13.8	0.17	13.8	0.17
C-ABD	31.2	20.8	3.0	0.10	3.0	0.10
C-D	38.9	26.0				
C-A	487.3	324.9				
ALL	1289.7	859.8	31.1	0.02	31.1	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

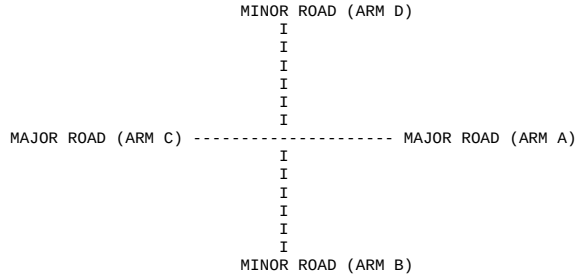
Run with file:-
"C:\TRL Files\Junction\PICADY 5\409-1376-00002 Otterpool\Scenario 1\PM Peak 2018.vpi"
(drive-on-the-left) at 13:17:51 on Thursday, 1 November 2007

.RUN INFORMATION
****

RUN TITLE: Scenario 1 - PM Peak 2018
LOCATION: A20 Site Access Junction
DATE: 01/11/07
CLIENT: Countrystyle Recycling
ENUMERATOR: mshephard [000473_LAP]
JOB NUMBER: 409.1376.00002
STATUS: TIA
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A20 East
ARM B IS Site Access
ARM C IS A20 West
ARM D IS Transport Cafe

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.00 M.	(W) 8.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.	(WA-D) 2.20 M.
- VISIBILITY	(VC-B) 200.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 12.0 M.	(VD-A) 10.0 M.
- VISIBILITY TO RIGHT	(VB-A) 10.0 M.	(VD-C) 10.0 M.
- LANE 1 WIDTH	(WB-C) -	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) -	(WD-C) 0.00 M.
- WIDTH AT 0 M FROM JUNC.	10.00 M.	-
- WIDTH AT 5 M FROM JUNC.	5.00 M.	-
- WIDTH AT 10 M FROM JUNC.	3.65 M.	-
- WIDTH AT 15 M FROM JUNC.	3.65 M.	-
- WIDTH AT 20 M FROM JUNC.	3.65 M.	-
- LENGTH OF FLARED SECTION	DERIVED: 1 PCU	

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
579.75	0.21	0.08

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D
671.24	0.24	0.09

B-A Stream

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream D-A	Slope For Opposing Stream D-B
447.53	0.19	0.19	0.19	0.19

Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C
0.07	0.12	0.27	0.09

D-C Stream

Intercept For Stream D-C	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream B-C	Slope For Opposing Stream B-D
517.47	0.22	0.22	0.22	0.22

Slope For Opposing Stream C-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream B-A
0.09	0.14	0.31	0.11

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D
689.79	0.24	0.35

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
689.79	0.24	0.35

B-D Stream From Left Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

B-D Stream From Right Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

D-B Stream From Left Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

D-B Stream From Right Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

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.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: AM Peak 2008

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	4.36	6.54	4.36
ARM B	15.00	45.00	75.00	0.43	0.64	0.43
ARM C	15.00	45.00	75.00	6.26	9.39	6.26
ARM D	15.00	45.00	75.00	0.73	1.09	0.73

.

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
16.45 - 18.15					
	ARM A	0.000	0.023	0.894	0.083
		0.0	8.0	312.0	29.0
		(0.0)	(100.0)	(9.1)	(10.0)
	ARM B	0.618	0.000	0.382	0.000
		21.0	0.0	13.0	0.0
		(39.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.942	0.000	0.000	0.058
		472.0	0.0	0.0	29.0
		(8.0)	(0.0)	(0.0)	(10.0)
	ARM D	0.500	0.000	0.500	0.000
		29.0	0.0	29.0	0.0
		(10.0)	(0.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-CD	0.16	9.83	0.017		0.00	0.02	0.2		0.10
B-AD	0.26	4.92	0.054		0.00	0.06	0.8		0.21
A-BCD	0.54	11.58	0.047		0.00	0.07	1.0		0.09
A-B	0.10								
A-C	3.74								
D-ABC	0.73	7.00	0.104		0.00	0.11	1.6		0.16
C-ABD	0.00	9.33	0.000		0.00	0.00	0.0		0.00
C-D	0.36								
C-A	5.92								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-CD	0.19	9.60	0.020		0.02	0.02	0.3		0.11
B-AD	0.31	4.62	0.068		0.06	0.07	1.0		0.23
A-BCD	0.70	11.82	0.059		0.07	0.10	1.4		0.09
A-B	0.11								
A-C	4.41								
D-ABC	0.87	6.63	0.131		0.11	0.15	2.2		0.17
C-ABD	0.00	9.11	0.000		0.00	0.00	0.0		0.00
C-D	0.43								
C-A	7.07								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-CD	0.24	9.27	0.026		0.02	0.03	0.4		0.11
B-AD	0.39	4.21	0.091		0.07	0.10	1.4		0.26
A-BCD	1.01	12.29	0.082		0.10	0.15	2.3		0.09
A-B	0.13								
A-C	5.26								
D-ABC	1.06	6.11	0.174		0.15	0.21	3.0		0.20
C-ABD	0.00	8.81	0.000		0.00	0.00	0.0		0.00
C-D	0.53								
C-A	8.66								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-CD	0.24	9.27	0.026		0.03	0.03	0.4		0.11
B-AD	0.39	4.21	0.092		0.10	0.10	1.5		0.26
A-BCD	1.01	12.29	0.082		0.15	0.15	2.3		0.09
A-B	0.13								
A-C	5.26								
D-ABC	1.06	6.11	0.174		0.21	0.21	3.1		0.20
C-ABD	0.00	8.81	0.000		0.00	0.00	0.0		0.00
C-D	0.53								
C-A	8.66								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-CD	0.19	9.60	0.020		0.03	0.02	0.3		0.11
B-AD	0.31	4.62	0.068		0.10	0.07	1.2		0.23
A-BCD	0.70	11.83	0.059		0.15	0.10	1.5		0.09
A-B	0.11								
A-C	4.41								
D-ABC	0.87	6.63	0.131		0.21	0.15	2.4		0.17
C-ABD	0.00	9.11	0.000		0.00	0.00	0.0		0.00
C-D	0.43								
C-A	7.07								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-CD	0.16	9.83	0.017		0.02	0.02	0.3		0.10
B-AD	0.26	4.92	0.054		0.07	0.06	0.9		0.21
A-BCD	0.54	11.58	0.047		0.10	0.07	1.1		0.09
A-B	0.10								
A-C	3.74								
D-ABC	0.73	7.00	0.104		0.15	0.12	1.8		0.16
C-ABD	0.00	9.33	0.000		0.00	0.00	0.0		0.00
C-D	0.36								
C-A	5.92								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-CD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.1
17.45	0.1
18.00	0.1
18.15	0.1

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.2
17.45	0.2
18.00	0.1
18.15	0.1

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.2
17.45	0.2
18.00	0.2
18.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-CD	17.9	11.9	1.9	0.11	1.9	0.11
B-AD	28.9	19.3	6.8	0.24	6.8	0.24
A-BCD	67.6	45.0	9.6	0.14	9.6	0.14
A-B	10.3	6.9				
A-C	402.5	268.3				
D-ABC	79.8	53.2	14.1	0.18	14.1	0.18
C-ABD	0.0	0.0	0.0	0.00	0.0	0.00
C-D	39.9	26.6				
C-A	649.7	433.1				
ALL	1296.6	864.4	32.5	0.03	32.5	0.03

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

TRL LIMITED

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

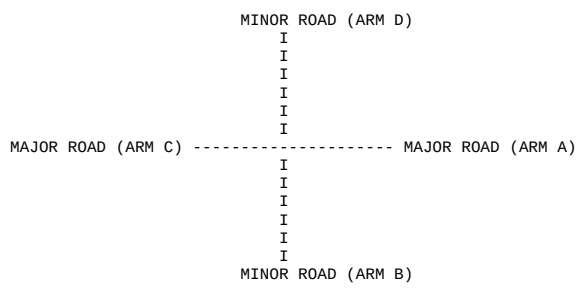
Run with file:-
"C:\TRL Files\Junction\PICADY 5\409-1376-00002 Otterpool\Scenario 2\AM Peak 2008.vpi"
(drive-on-the-left) at 13:40:29 on Thursday, 1 November 2007

.RUN INFORMATION
****

RUN TITLE: Scenario 2 - AM Peak 2008
LOCATION: A20 Site Access Junction
DATE: 01/11/07
CLIENT: Countrystyle Recycling
ENUMERATOR: mshephard [000473_LAP]
JOB NUMBER: 409.1376.00002
STATUS: TIA
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A20 East
ARM B IS Site Access
ARM C IS A20 West
ARM D IS Transport Cafe

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.00 M.	(W) 8.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.	(WA-D) 2.20 M.
- VISIBILITY	(VC-B) 200.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 12.0 M.	(VD-A) 10.0 M.
- VISIBILITY TO RIGHT	(VB-A) 10.0 M.	(VD-C) 10.0 M.
- LANE 1 WIDTH	(WB-C) -	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) -	(WD-C) 0.00 M.
- WIDTH AT 0 M FROM JUNC.	10.00 M.	-
- WIDTH AT 5 M FROM JUNC.	5.00 M.	-
- WIDTH AT 10 M FROM JUNC.	3.65 M.	-
- WIDTH AT 15 M FROM JUNC.	3.65 M.	-
- WIDTH AT 20 M FROM JUNC.	3.65 M.	-
- LENGTH OF FLARED SECTION	DERIVED: 1 PCU	

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
579.75	0.21	0.08

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D
671.24	0.24	0.09

B-A Stream

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream D-A	Slope For Opposing Stream D-B
447.53	0.19	0.19	0.19	0.19

Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C
0.07	0.12	0.27	0.09

D-C Stream

Intercept For Stream D-C	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream B-C	Slope For Opposing Stream B-D
517.47	0.22	0.22	0.22	0.22

Slope For Opposing Stream C-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream B-A
0.09	0.14	0.31	0.11

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D
689.79	0.24	0.35

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
689.79	0.24	0.35

B-D Stream From Left Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

B-D Stream From Right Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

D-B Stream From Left Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

D-B Stream From Right Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

.

.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: AM Peak 2008

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	5.10	7.65	5.10
ARM B	15.00	45.00	75.00	0.10	0.15	0.10
ARM C	15.00	45.00	75.00	4.53	6.79	4.53
ARM D	15.00	45.00	75.00	0.63	0.94	0.63

TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) / (PERCENTAGE OF H.V.S)					
TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
07.45 - 09.15	ARM A	0.000 0.0 (0.0)	0.042 17.0 (24.2)	0.897 366.0 (12.3)	0.061 25.0 (10.0)
	ARM B	0.500 4.0 (100.0)	0.000 0.0 (0.0)	0.500 4.0 (100.0)	0.000 0.0 (0.0)
	ARM C	0.884 320.0 (15.4)	0.047 17.0 (24.2)	0.000 0.0 (0.0)	0.069 25.0 (10.0)
	ARM D	0.500 25.0 (10.0)	0.000 0.0 (0.0)	0.500 25.0 (10.0)	0.000 0.0 (0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00										
	B-CD	0.05	5.00	0.010		0.00	0.01	0.1		0.20
	B-AD	0.05	3.32	0.015		0.00	0.02	0.2		0.31
	A-BCD	0.49	12.32	0.040		0.00	0.06	0.8		0.08
	A-B	0.21								
	A-C	4.42								
	D-ABC	0.63	7.30	0.086		0.00	0.09	1.3		0.15
	C-ABD	0.34	11.00	0.031		0.00	0.04	0.6		0.09
	C-D	0.30								
	C-A	3.90								

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15										
	B-CD	0.06	4.87	0.012		0.01	0.01	0.2		0.21
	B-AD	0.06	3.12	0.019		0.02	0.02	0.3		0.33
	A-BCD	0.64	12.69	0.051		0.06	0.08	1.2		0.08
	A-B	0.24								
	A-C	5.23								
	D-ABC	0.75	6.99	0.107		0.09	0.12	1.7		0.16
	C-ABD	0.44	11.35	0.039		0.04	0.05	0.8		0.09
	C-D	0.36								
	C-A	4.62								

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30										
	B-CD	0.07	4.69	0.016		0.01	0.02	0.2		0.22
	B-AD	0.07	2.84	0.026		0.02	0.03	0.4		0.36
	A-BCD	0.94	13.38	0.070		0.08	0.12	1.8		0.08
	A-B	0.29								
	A-C	6.25								
	D-ABC	0.92	6.54	0.140		0.12	0.16	2.3		0.18
	C-ABD	0.65	12.00	0.054		0.05	0.08	1.3		0.09
	C-D	0.43								
	C-A	5.56								

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45										
	B-CD	0.07	4.69	0.016		0.02	0.02	0.2		0.22
	B-AD	0.07	2.84	0.026		0.03	0.03	0.4		0.36
	A-BCD	0.94	13.38	0.071		0.12	0.12	1.9		0.08
	A-B	0.29								
	A-C	6.25								
	D-ABC	0.92	6.54	0.140		0.16	0.16	2.4		0.18
	C-ABD	0.65	12.00	0.054		0.08	0.08	1.3		0.09
	C-D	0.43								
	C-A	5.56								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-CD	0.06	4.87	0.012		0.02	0.01	0.2		0.21
B-AD	0.06	3.12	0.019		0.03	0.02	0.3		0.33
A-BCD	0.64	12.69	0.051		0.12	0.08	1.2		0.08
A-B	0.24								
A-C	5.23								
D-ABC	0.75	6.98	0.107		0.16	0.12	1.9		0.16
C-ABD	0.44	11.35	0.039		0.08	0.06	0.8		0.09
C-D	0.36								
C-A	4.62								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-CD	0.05	5.00	0.010		0.01	0.01	0.2		0.20
B-AD	0.05	3.32	0.015		0.02	0.02	0.2		0.31
A-BCD	0.49	12.32	0.040		0.08	0.06	0.9		0.08
A-B	0.21								
A-C	4.42								
D-ABC	0.63	7.30	0.086		0.12	0.10	1.5		0.15
C-ABD	0.34	11.00	0.031		0.06	0.04	0.6		0.09
C-D	0.30								
C-A	3.90								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-CD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.1
09.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-CD	5.5	3.7	1.1	0.21	1.1	0.21
B-AD	5.5	3.7	1.8	0.33	1.8	0.33
A-BCD	62.4	41.6	7.7	0.12	7.7	0.12
A-B	22.2	14.8				
A-C	477.1	318.0				
D-ABC	68.8	45.9	11.2	0.16	11.2	0.16
C-ABD	42.8	28.6	5.4	0.13	5.4	0.13
C-D	33.0	22.0				
C-A	422.4	281.6				
ALL	1139.7	759.8	27.2	0.02	27.3	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

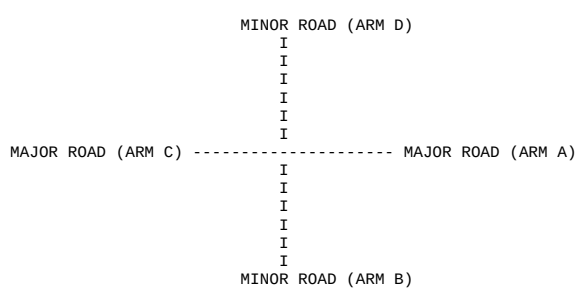
Run with file:-
"C:\TRL Files\Junction\PICADY 5\409-1376-00002 Otterpool\Scenario 2\PM Peak 2008.vpi"
(drive-on-the-left) at 13:35:21 on Thursday, 1 November 2007

.RUN INFORMATION
****

RUN TITLE: Scenario 2 - PM Peak 2008
LOCATION: A20 Site Access Junction
DATE: 01/11/07
CLIENT: Countrystyle Recycling
ENUMERATOR: mshephard [000473_LAP]
JOB NUMBER: 409.1376.00002
STATUS: TIA
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A20 East
ARM B IS Site Access
ARM C IS A20 West
ARM D IS Transport Cafe

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.00 M.	(W) 8.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.	(WA-D) 2.20 M.
- VISIBILITY	(VC-B) 200.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 12.0 M.	(VD-A) 10.0 M.
- VISIBILITY TO RIGHT	(VB-A) 10.0 M.	(VD-C) 10.0 M.
- LANE 1 WIDTH	(WB-C) -	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) -	(WD-C) 0.00 M.
- WIDTH AT 0 M FROM JUNC.	10.00 M.	-
- WIDTH AT 5 M FROM JUNC.	5.00 M.	-
- WIDTH AT 10 M FROM JUNC.	3.65 M.	-
- WIDTH AT 15 M FROM JUNC.	3.65 M.	-
- WIDTH AT 20 M FROM JUNC.	3.65 M.	-
- LENGTH OF FLARED SECTION	DERIVED: 1 PCU	

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
579.75	0.21	0.08

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D
671.24	0.24	0.09

B-A Stream

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream D-A	Slope For Opposing Stream D-B
447.53	0.19	0.19	0.19	0.19

Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C
0.07	0.12	0.27	0.09

D-C Stream

Intercept For Stream D-C	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream B-C	Slope For Opposing Stream B-D
517.47	0.22	0.22	0.22	0.22

Slope For Opposing Stream C-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream B-A
0.09	0.14	0.31	0.11

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D
689.79	0.24	0.35

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
689.79	0.24	0.35

B-D Stream From Left Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

B-D Stream From Right Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

D-B Stream From Left Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

D-B Stream From Right Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

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.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: AM Peak 2008

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	3.78	5.66	3.78
ARM B	15.00	45.00	75.00	0.43	0.64	0.43
ARM C	15.00	45.00	75.00	5.54	8.31	5.54
ARM D	15.00	45.00	75.00	0.63	0.94	0.63

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
16.45 - 18.15					
	ARM A	0.000	0.013	0.904	0.083
		0.0	4.0	273.0	25.0
		(0.0)	(100.0)	(9.1)	(10.0)
	ARM B	0.500	0.000	0.500	0.000
		17.0	0.0	17.0	0.0
		(24.2)	(0.0)	(24.2)	(0.0)
	ARM C	0.935	0.009	0.000	0.056
		414.0	4.0	0.0	25.0
		(8.0)	(100.0)	(0.0)	(10.0)
	ARM D	0.500	0.000	0.500	0.000
		25.0	0.0	25.0	0.0
		(10.0)	(0.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-CD	0.21	8.28	0.026		0.00	0.03	0.4		0.12
B-AD	0.21	5.55	0.038		0.00	0.04	0.6		0.19
A-BCD	0.44	11.38	0.039		0.00	0.05	0.8		0.09
A-B	0.05								
A-C	3.30								
D-ABC	0.63	7.21	0.087		0.00	0.09	1.4		0.15
C-ABD	0.11	9.43	0.012		0.00	0.01	0.2		0.11
C-D	0.31								
C-A	5.14								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-CD	0.25	8.12	0.031		0.03	0.03	0.5		0.13
B-AD	0.25	5.26	0.048		0.04	0.05	0.7		0.20
A-BCD	0.57	11.58	0.049		0.05	0.07	1.1		0.09
A-B	0.06								
A-C	3.90								
D-ABC	0.75	6.88	0.109		0.09	0.12	1.8		0.16
C-ABD	0.15	10.10	0.015		0.01	0.02	0.2		0.10
C-D	0.37								
C-A	6.12								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-CD	0.31	7.89	0.040		0.03	0.04	0.6		0.13
B-AD	0.31	4.86	0.064		0.05	0.07	1.0		0.22
A-BCD	0.79	11.95	0.066		0.07	0.11	1.7		0.09
A-B	0.07								
A-C	4.68								
D-ABC	0.92	6.42	0.143		0.12	0.16	2.4		0.18
C-ABD	0.21	10.98	0.019		0.02	0.02	0.3		0.09
C-D	0.45								
C-A	7.47								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-CD	0.31	7.89	0.040		0.04	0.04	0.6		0.13
B-AD	0.31	4.86	0.064		0.07	0.07	1.0		0.22
A-BCD	0.79	11.95	0.066		0.11	0.11	1.7		0.09
A-B	0.07								
A-C	4.68								
D-ABC	0.92	6.42	0.143		0.16	0.17	2.5		0.18
C-ABD	0.21	10.98	0.019		0.02	0.02	0.3		0.09
C-D	0.45								
C-A	7.47								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-CD	0.25	8.12	0.031		0.04	0.03	0.5		0.13
B-AD	0.25	5.26	0.048		0.07	0.05	0.8		0.20
A-BCD	0.57	11.58	0.049		0.11	0.08	1.1		0.09
A-B	0.06								
A-C	3.90								
D-ABC	0.75	6.88	0.109		0.17	0.12	1.9		0.16
C-ABD	0.15	10.10	0.015		0.02	0.02	0.3		0.10
C-D	0.37								
C-A	6.12								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-CD	0.21	8.28	0.026		0.03	0.03	0.4		0.12
B-AD	0.21	5.54	0.038		0.05	0.04	0.6		0.19
A-BCD	0.44	11.38	0.039		0.08	0.06	0.8		0.09
A-B	0.05								
A-C	3.30								
D-ABC	0.63	7.21	0.087		0.12	0.10	1.5		0.15
C-ABD	0.11	9.43	0.012		0.02	0.01	0.2		0.11
C-D	0.31								
C-A	5.14								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-CD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.1
17.30	0.1
17.45	0.1
18.00	0.1
18.15	0.0

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.1
17.45	0.1
18.00	0.1
18.15	0.1

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.2
17.45	0.2
18.00	0.1
18.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-CD	23.4	15.6	3.0	0.13	3.0	0.13
B-AD	23.4	15.6	4.7	0.20	4.7	0.20
A-BCD	54.1	36.1	7.3	0.13	7.3	0.13
A-B	5.2	3.5				
A-C	356.3	237.5				
D-ABC	68.8	45.9	11.4	0.17	11.4	0.17
C-ABD	14.0	9.3	1.6	0.11	1.6	0.11
C-D	33.9	22.6				
C-A	561.9	374.6				
ALL	1141.1	760.7	27.9	0.02	27.9	0.02

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

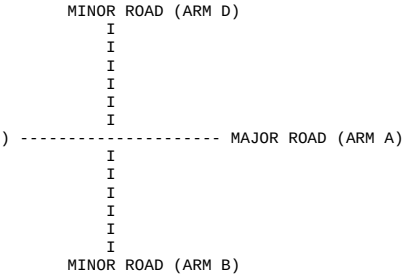
Run with file:-
"C:\TRL Files\Junction\PICADY 5\409-1376-00002 Otterpool\Scenario 2\AM Peak 2018.vpi"
(drive-on-the-left) at 13:33:40 on Thursday, 1 November 2007

.RUN INFORMATION
****

RUN TITLE: Scenario 2 - AM Peak 2018
LOCATION: A20 Site Access Junction
DATE: 01/11/07
CLIENT: Countrystyle Recycling
ENUMERATOR: mshephard [000473_LAP]
JOB NUMBER: 409.1376.00002
STATUS: TIA
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A20 East
ARM B IS Site Access
ARM C IS A20 West
ARM D IS Transport Cafe

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.00 M.	(W) 8.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.	(WA-D) 2.20 M.
- VISIBILITY	(VC-B) 200.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 12.0 M.	(VD-A) 10.0 M.
- VISIBILITY TO RIGHT	(VB-A) 10.0 M.	(VD-C) 10.0 M.
- LANE 1 WIDTH	(WB-C) -	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) -	(WD-C) 0.00 M.
- WIDTH AT 0 M FROM JUNC.	10.00 M.	-
- WIDTH AT 5 M FROM JUNC.	5.00 M.	-
- WIDTH AT 10 M FROM JUNC.	3.65 M.	-
- WIDTH AT 15 M FROM JUNC.	3.65 M.	-
- WIDTH AT 20 M FROM JUNC.	3.65 M.	-
- LENGTH OF FLARED SECTION	DERIVED: 1 PCU	

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
579.75	0.21	0.08

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D
671.24	0.24	0.09

B-A Stream

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream D-A	Slope For Opposing Stream D-B
447.53	0.19	0.19	0.19	0.19

Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C
0.07	0.12	0.27	0.09

D-C Stream

Intercept For Stream D-C	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream B-C	Slope For Opposing Stream B-D
517.47	0.22	0.22	0.22	0.22

Slope For Opposing Stream C-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream B-A
0.09	0.14	0.31	0.11

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D
689.79	0.24	0.35

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
689.79	0.24	0.35

B-D Stream From Left Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

B-D Stream From Right Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

D-B Stream From Left Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

D-B Stream From Right Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

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.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: AM Peak 2008

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	5.78	8.66	5.78
ARM B	15.00	45.00	75.00	0.10	0.15	0.10
ARM C	15.00	45.00	75.00	5.11	7.67	5.11
ARM D	15.00	45.00	75.00	0.73	1.09	0.73

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TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
07.45 - 09.15					
	ARM A	0.000	0.037	0.900	0.063
		0.0	17.0	416.0	29.0
		(0.0)	(24.2)	(12.3)	(10.0)
	ARM B	0.500	0.000	0.500	0.000
		4.0	0.0	4.0	0.0
		(100.0)	(0.0)	(100.0)	(0.0)
	ARM C	0.888	0.042	0.000	0.071
		363.0	17.0	0.0	29.0
		(15.4)	(24.2)	(0.0)	(10.0)
	ARM D	0.500	0.000	0.500	0.000
		29.0	0.0	29.0	0.0
		(10.0)	(0.0)	(10.0)	(0.0)

TURNING PROPORTIONS

TURNING COUNTS (VEH/HR)

(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-CD	0.05	4.91	0.010		0.00	0.01	0.1		0.21
B-AD	0.05	3.19	0.016		0.00	0.02	0.2		0.32
A-BCD	0.60	12.57	0.048		0.00	0.07	1.1		0.08
A-B	0.20								
A-C	4.99								
D-ABC	0.73	7.09	0.103		0.00	0.11	1.6		0.16
C-ABD	0.36	11.25	0.032		0.00	0.04	0.6		0.09
C-D	0.35								
C-A	4.42								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-CD	0.06	4.77	0.013		0.01	0.01	0.2		0.21
B-AD	0.06	2.96	0.020		0.02	0.02	0.3		0.34
A-BCD	0.84	13.14	0.064		0.07	0.11	1.6		0.08
A-B	0.24								
A-C	5.84								
D-ABC	0.87	6.73	0.129		0.11	0.15	2.1		0.17
C-ABD	0.47	11.64	0.041		0.04	0.06	0.9		0.09
C-D	0.42								
C-A	5.24								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-CD	0.07	4.57	0.016		0.01	0.02	0.2		0.22
B-AD	0.07	2.64	0.028		0.02	0.03	0.4		0.39
A-BCD	1.21	13.80	0.087		0.11	0.17	2.5		0.08
A-B	0.29								
A-C	6.99								
D-ABC	1.06	6.22	0.171		0.15	0.20	3.0		0.19
C-ABD	0.72	12.42	0.058		0.06	0.09	1.4		0.09
C-D	0.50								
C-A	6.29								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-CD	0.07	4.57	0.016		0.02	0.02	0.2		0.22
B-AD	0.07	2.64	0.028		0.03	0.03	0.4		0.39
A-BCD	1.21	13.81	0.087		0.17	0.17	2.6		0.08
A-B	0.29								
A-C	6.99								
D-ABC	1.06	6.22	0.171		0.20	0.20	3.1		0.19
C-ABD	0.72	12.42	0.058		0.09	0.09	1.4		0.09
C-D	0.50								
C-A	6.29								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-CD	0.06	4.77	0.013		0.02	0.01	0.2		0.21
B-AD	0.06	2.96	0.020		0.03	0.02	0.3		0.34
A-BCD	0.85	13.14	0.064		0.17	0.11	1.7		0.08
A-B	0.24								
A-C	5.84								
D-ABC	0.87	6.73	0.129		0.20	0.15	2.3		0.17
C-ABD	0.48	11.64	0.041		0.09	0.06	0.9		0.09
C-D	0.42								
C-A	5.23								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-CD	0.05	4.91	0.010		0.01	0.01	0.2		0.21
B-AD	0.05	3.19	0.016		0.02	0.02	0.3		0.32
A-BCD	0.61	12.57	0.048		0.11	0.07	1.1		0.08
A-B	0.20								
A-C	4.99								
D-ABC	0.73	7.09	0.103		0.15	0.12	1.8		0.16
C-ABD	0.36	11.25	0.032		0.06	0.04	0.6		0.09
C-D	0.35								
C-A	4.42								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-CD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.1
09.15	0.1

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-CD	5.5	3.7	1.2	0.21	1.2	0.21
B-AD	5.5	3.7	1.9	0.35	1.9	0.35
A-BCD	79.7	53.1	10.5	0.13	10.5	0.13
A-B	21.8	14.6				
A-C	534.4	356.3				
D-ABC	79.8	53.2	13.9	0.17	13.9	0.17
C-ABD	46.6	31.0	5.8	0.12	5.8	0.12
C-D	38.2	25.5				
C-A	478.2	318.8				
ALL	1289.7	859.8	33.3	0.03	33.3	0.03

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

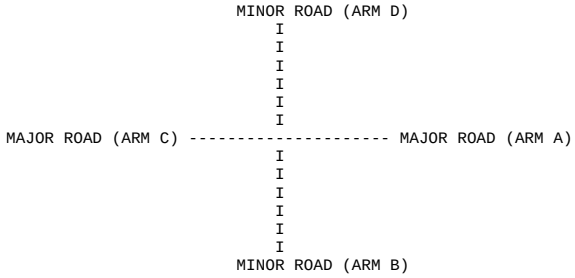
Run with file:-
"C:\TRL Files\Junction\PICADY 5\409-1376-00002 Otterpool\Scenario 2\PM Peak 2018.vpi"
(drive-on-the-left) at 13:36:19 on Thursday, 1 November 2007

.RUN INFORMATION
****

RUN TITLE: Scenario 2 - PM Peak 2018
LOCATION: A20 Site Access Junction
DATE: 01/11/07
CLIENT: Countrystyle Recycling
ENUMERATOR: mshephard [000473_LAP]
JOB NUMBER: 409.1376.00002
STATUS: TIA
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY
****

INPUT DATA



ARM A IS A20 East
ARM B IS Site Access
ARM C IS A20 West
ARM D IS Transport Cafe

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C

ETC.

.GEOMETRIC DATA

DATA ITEM	MINOR ROAD B	MINOR ROAD D
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 8.00 M.	(W) 8.00 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 2.20 M.	(WA-D) 2.20 M.
- VISIBILITY	(VC-B) 200.0 M.	(VA-D) 200.0 M.
- BLOCKS TRAFFIC	YES	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 12.0 M.	(VD-A) 10.0 M.
- VISIBILITY TO RIGHT	(VB-A) 10.0 M.	(VD-C) 10.0 M.
- LANE 1 WIDTH	(WB-C) -	(WD-A) 3.65 M.
- LANE 2 WIDTH	(WB-A) -	(WD-C) 0.00 M.
- WIDTH AT 0 M FROM JUNC.	10.00 M.	-
- WIDTH AT 5 M FROM JUNC.	5.00 M.	-
- WIDTH AT 10 M FROM JUNC.	3.65 M.	-
- WIDTH AT 15 M FROM JUNC.	3.65 M.	-
- WIDTH AT 20 M FROM JUNC.	3.65 M.	-
- LENGTH OF FLARED SECTION	DERIVED: 1 PCU	

.SLOPES AND INTERCPET

(NB:Streams may be combined, in which case capacity

will be adjusted)

B-C Stream

Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B
579.75	0.21	0.08

D-A Stream

Intercept For Stream D-A	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D
671.24	0.24	0.09

B-A Stream

Intercept For Stream B-A	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream D-A	Slope For Opposing Stream D-B
447.53	0.19	0.19	0.19	0.19

Slope For Opposing Stream A-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C
0.07	0.12	0.27	0.09

D-C Stream

Intercept For Stream D-C	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream B-C	Slope For Opposing Stream B-D
517.47	0.22	0.22	0.22	0.22

Slope For Opposing Stream C-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream B-A
0.09	0.14	0.31	0.11

C-B Stream

Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D
689.79	0.24	0.35

A-D Stream

Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B
689.79	0.24	0.35

B-D Stream From Left Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

B-D Stream From Right Hand Lane

Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B
447.53	0.19	0.19	0.07	0.27

Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing	Slope For Opposing
0.12	0.12		

D-B Stream From Left Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

D-B Stream From Right Hand Lane

Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D
517.47	0.22	0.22	0.09	0.31

Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing	Slope For Opposing
0.14	0.14		

.

.TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: AM Peak 2008

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	NUMBER OF MINUTES FROM START WHEN TOP OF PEAK IS REACHED	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	4.31	6.47	4.31
ARM B	15.00	45.00	75.00	0.43	0.64	0.43
ARM C	15.00	45.00	75.00	6.31	9.47	6.31
ARM D	15.00	45.00	75.00	0.73	1.09	0.73

.

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
16.45 - 18.15					
	ARM A	0.000	0.012	0.904	0.084
		0.0	4.0	312.0	29.0
		(0.0)	(100.0)	(9.1)	(10.0)
	ARM B	0.500	0.000	0.500	0.000
		17.0	0.0	17.0	0.0
		(24.2)	(0.0)	(24.2)	(0.0)
	ARM C	0.935	0.008	0.000	0.057
		472.0	4.0	0.0	29.0
		(8.0)	(100.0)	(0.0)	(10.0)
	ARM D	0.500	0.000	0.500	0.000
		29.0	0.0	29.0	0.0
		(10.0)	(0.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-CD	0.21	8.18	0.026		0.00	0.03	0.4		0.13
B-AD	0.21	5.34	0.040		0.00	0.04	0.6		0.19
A-BCD	0.54	11.53	0.047		0.00	0.07	1.0		0.09
A-B	0.05								
A-C	3.74								
D-ABC	0.73	6.98	0.104		0.00	0.12	1.7		0.16
C-ABD	0.12	9.92	0.012		0.00	0.01	0.2		0.10
C-D	0.36								
C-A	5.86								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-CD	0.25	7.99	0.032		0.03	0.03	0.5		0.13
B-AD	0.25	5.01	0.051		0.04	0.05	0.8		0.21
A-BCD	0.70	11.77	0.059		0.07	0.10	1.4		0.09
A-B	0.06								
A-C	4.41								
D-ABC	0.87	6.60	0.132		0.12	0.15	2.2		0.17
C-ABD	0.16	10.66	0.015		0.01	0.02	0.3		0.10
C-D	0.43								
C-A	6.98								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-CD	0.31	7.74	0.040		0.03	0.04	0.6		0.13
B-AD	0.31	4.56	0.068		0.05	0.07	1.0		0.24
A-BCD	1.00	12.22	0.082		0.10	0.15	2.3		0.09
A-B	0.07								
A-C	5.26								
D-ABC	1.06	6.07	0.175		0.15	0.21	3.0		0.20
C-ABD	0.23	11.63	0.020		0.02	0.02	0.4		0.09
C-D	0.52								
C-A	8.51								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-CD	0.31	7.74	0.040		0.04	0.04	0.6		0.13
B-AD	0.31	4.56	0.068		0.07	0.07	1.1		0.24
A-BCD	1.00	12.22	0.082		0.15	0.15	2.3		0.09
A-B	0.07								
A-C	5.26								
D-ABC	1.06	6.07	0.175		0.21	0.21	3.2		0.20
C-ABD	0.23	11.63	0.020		0.02	0.02	0.4		0.09
C-D	0.52								
C-A	8.51								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-CD	0.25	7.99	0.032		0.04	0.03	0.5		0.13
B-AD	0.25	5.01	0.051		0.07	0.05	0.8		0.21
A-BCD	0.70	11.77	0.059		0.15	0.10	1.5		0.09
A-B	0.06								
A-C	4.41								
D-ABC	0.87	6.60	0.132		0.21	0.15	2.4		0.17
C-ABD	0.16	10.66	0.015		0.02	0.02	0.3		0.10
C-D	0.43								
C-A	6.98								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
B-CD	0.21	8.18	0.026		0.03	0.03	0.4		0.13
B-AD	0.21	5.34	0.040		0.05	0.04	0.7		0.20
A-BCD	0.54	11.53	0.047		0.10	0.07	1.1		0.09
A-B	0.05								
A-C	3.74								
D-ABC	0.73	6.98	0.104		0.15	0.12	1.8		0.16
C-ABD	0.12	9.92	0.012		0.02	0.01	0.2		0.10
C-D	0.36								
C-A	5.86								

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-CD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.1
17.30	0.1
17.45	0.1
18.00	0.1
18.15	0.0

QUEUE FOR STREAM A-BCD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.2
17.45	0.2
18.00	0.1
18.15	0.1

QUEUE FOR STREAM D-ABC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.1
17.15	0.1
17.30	0.2
17.45	0.2
18.00	0.2
18.15	0.1

QUEUE FOR STREAM C-ABD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-CD	23.4	15.6	3.0	0.13	3.0	0.13
B-AD	23.4	15.6	5.0	0.21	5.0	0.21
A-BCD	67.3	44.8	9.6	0.14	9.6	0.14
A-B	5.2	3.4				
A-C	402.4	268.3				
D-ABC	79.8	53.2	14.2	0.18	14.2	0.18
C-ABD	15.5	10.3	1.7	0.11	1.7	0.11
C-D	39.3	26.2				
C-A	640.3	426.9				
ALL	1296.6	864.4	33.5	0.03	33.5	0.03

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

GIVE WAY

SIGN NO 602

0.75M RADIUS TRIEF KERBING TO BE USED BETWEEN HIGHWAY BOUNDRY AND SITE GATES

TRAFFIC BOLLARD

NEW HB2 KERBS

4.5M WIDE CARRIAGEWAY

Max Legal Articulated Vehicle

NEW HB2 KERBS

20M RADIUS TRIEF KERBING TO BE USED BETWEEN HIGHWAY BOUNDRY AND SITE GATES

5M WIDE CARRIAGEWAY

SIGN NO 613

BOLLARD WITH SIGN NO 610

Max Legal Articulated Vehicle

GATES TO BE POSITIONED MINIMUM OF 15M FROM JUNCTION EDGE AND TO OPEN INWARDS

NOTES

LEGEND

4.5m X 160m VISIBILITY SPLAY

Revision	Issue Date	Issued By	Comments
0	MAY 08	MS	

COUNTRYstyle
WASTE MANAGEMENT SOLUTIONS

Site	OTTERPOOL AD & MRF DEVELOPMENT
Project	TRANSPORT ASSESSMENT

Drawing
Proposed Access Detail Design

Date	MAY 2008	Drawing No. HD1
Scale	1:200	
Paper Size: ISO A2		HD1_409-1376-00002_R0_PADD/CR

SLR
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Issues

Airport Cafe

SITE ENTRANCE

10m RADIUS

15m RADIUS WITH TAPER OF 1:10 OVER 25m

7.3m WIDE

WEIGHBRIDGES

MATERIALS RECYCLING / TRANSFER STATION

NOTES

LEGEND

4.5m X 60m VISIBILITY SPLAY

Revision	Issue Date	Issued By	Comments
0	NOV 07	MS	

COUNTRYstyle
WASTE MANAGEMENT SOLUTIONS

Site: OTTERPOOL AD & MRF DEVELOPMENT

Project: TRANSPORT ASSESSMENT

Drawing: **Swept Path Analysis**

Date: NOVEMBER 2007

Drawing No. 3

Scale: 1:500

Paper Size: ISO A3 03_409-1378-00002_R0_SPACE

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NOTES

LEGEND

- SITE BOUNDARY
- STUDY AREA
- SLIGHT ACCIDENT
- SERIOUS ACCIDENT
- FATAL ACCIDENT

Revision	Issue Date	Issued By	Comments
0	NOV 07	MS	

COUNTRYstyle
WASTE MANAGEMENT SOLUTIONS

Site	OTTERPOOL AD & MRF DEVELOPMENT
Project	TRANSPORT ASSESSMENT
Drawing	**Personal Injury Road Traffic Accidents**
Date	NOVEMBER 2007
Scale	NTS
Drawing No.	4
Paper Size: ISO A3	04_409-1975-00002_R0_ALICE

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SITE

NOTES

LEGEND

- SITE BOUNDARY
- SIGNED ON ROAD CYCLE ROUTE
- BUS STOPS

Revision	Issue Date	Issued By	Comments
0	NOV 07	MS	

COUNTRYstyle RECYCLING
WASTE MANAGEMENT SOLUTIONS

Site	OTTERPOOL AD & MRF DEVELOPMENT
Project	TRANSPORT ASSESSMENT
Drawing	**Existing Highway Network**
Date	NOVEMBER 2007
Scale	1:25,000
Drawing No.	1
Paper Size: ISO A3	01_409-1376-00002_R0_EHN02

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611200mE

611300mE

611400mE

611500mE

136700mN

136800mN

136900mN

Issues

SITE ENTRANCE

0.75m RADIUS

12m WIDE

20m RADIUS

OFFICE

PARKING FOR 26 CARS

PARKING FOR HGV'S

WEIGHBRIDGE

WEIGHBRIDGE

RECYCLING BINS BAILERS

FINISHED PRODUCT

MATERIALS RECYCLING / TRANSFER STATION

NOTES

LEGEND

4.5m X 160m VISIBILITY SPLAY

Revision	Issue Date	Issued By	Comments
1	APR 08	MS	
0	NOV 07	MS	

COUNTRYstyle
WASTE MANAGEMENT SOLUTIONS

Site: OTTERPOOL MD & MRF DEVELOPMENT

Project: TRANSPORT ASSESSMENT

Drawing: **Proposed Access Improvements**

Date: APRIL 2008

Drawing No.: 2

Scale: 1:500

Paper Size: ISO A2

02_409-1378-00002_R1_PA1/2/3

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Otterpool Quarry,
Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 5 –Air Quality Assessment

SLR Ref 409.1376.00002

COUNTRYstyle RECYCLING

WASTE MANAGEMENT SOLUTIONS

December 2007

solutions for today's environment

AIR QUALITY ASSESSMENT 5

CONTENTS

TABLES

FIGURES

APPENDICES

DRAWINGS

5.0 INTRODUCTION

Background

An assessment is presented of the potential air quality impacts relating to a proposed development at Otterpool Quarry, Kent. The development makes use of a redundant mineral and construction materials processing facility previously operated by Tarmac Quarries ('Tarmac') for the purpose of asphalt and ready mixed concrete production. The site is located approximately 1.5 km south southeast of Sellindge (grid reference TR 112365).

The site is presently cleared of all buildings but a number of concrete pads remain that supported various processing equipment. The applicant has subsequently processed a limited volume of mixed aggregate and historical process residues in order to tidy the site and allow an appreciation of potential volumes of surplus materials left over by Tarmac. The intention is that these will be used in the development of the site.

The development will comprise the following buildings and associated infrastructure:

- Office, Mess and Weighbridge facilities;
- An Anaerobic Digestion Plant (AD) that will process organic and green waste from existing commercial (trade) waste producers and, potentially, future municipal sources from within East Kent;
- A Material Recycling Facility (MRF) that will be designed to manage co-mingled recyclable materials generated by commercial and industrial waste producers. The enclosed plant will also have the capacity and capability to deal with possible future waste streams from municipal sources, and
- An open fronted building to house the digestate material during maturation.

Four specific development facets are identified as having the potential to impact on the air quality of the area. They are as follows:

- Emissions from vehicle movements on local link roads associated with construction and operation;
- Deposited dust resulting from construction and operational activities;
- Potential odour generating sources during operation associated with waste received at the MRF/AD plant; and
- Combustion emissions from gas plant associated with the AD plant.

This report represents the air quality assessment of the development proposals.

Scope

This assessment describes the impact of the development proposals on the aerial environment and addresses the following issues:

- Release of Air Quality Strategy (AQS) pollutants from vehicles;
- Deposited ‘nuisance’ dust;
- Suspended particulate matter; and
- Odour.

The significance and resultant impacts of emissions to air from the proposed development are dependent upon the relationship between:

- magnitude of the emissions;
- the prevailing meteorological conditions for that location; and
- the proximity of sensitive locations to the emission sources.

The potential for these to occur and give rise to health impacts and/or nuisance has been assessed.

Where development proposals are described, or this assessment touches on other technical specialisms covered in greater detail within the submission (such as highways), descriptions will refer to those aspects critical to the aerial environment only.

Structure of the Report

In order to satisfy the requirements of an Environmental Statement (ES) this chapter is structured to include:

- a summary of the relevant air quality legislation and guidelines associated with the potential air quality impacts from the Otterpool proposal;

- a description of the methodology used for the assessment of each of the air quality parameters assessed;

- a description of the surrounding environment, including the identification of potentially sensitive receptors and a description of local climate and air quality conditions;

- a detailed assessment of the potential impacts of the proposed emission sources on air quality. This also includes a brief discussion of mitigation options and concludes with residual effects for each of the parameters discussed;

- summary and conclusions.

5.1 TECHNICAL / LEGISLATIVE BACKGROUND

General Nuisance Legislation

Part III of the Environmental Protection Act (EPA) 1990 (as amended by the Noise and Statutory Nuisance Act 1993) contains the main legislation on statutory nuisance and allows local authorities and individuals to take action to prevent a statutory nuisance. Section 79 of the EPA defines, amongst other things, smoke, fumes, dust and smells emitted from industrial, trade or business premises so as to be prejudicial to health or a nuisance, as a potential Statutory Nuisance. It also defines accumulation or deposit, which is prejudicial to health or a nuisance.

Planning Policy

Planning Policy Statement PPS23 provides advice relating to issues governing whether development would be advisable. This includes development constraints and opportunities as related to air quality. This Planning Policy Statement advises that:

'more weight will generally need to be given to air quality considerations, for example, where a development would have a significant impact on air quality inside, or adjacent to, an AQMA (Air Quality Management Area) '

However, the same statement also warns against the 'sterilisation' of an area due to rejection of all development on air quality grounds and states that the significance of one consideration relative to another will vary dependent upon circumstances.

NCSA Development Control: Planning for Air Quality

This document provides a framework for air quality considerations to be accounted for in local development control processes. The guidance contains a qualitative approach to addressing air quality issues rather than relying on the more traditional numerical thresholds. This method is linked to a process for developing recommendations to reduce the air quality impacts of development proposals. The key point to this approach is that it stresses that it is not unacceptable developments but unacceptable impacts which must be managed.

Air Quality Strategy

Background

The 'Air Quality Strategy for England, Scotland, Wales and Northern Ireland' was published in 2000 and updated with an addendum in February 2003. The Strategy has been adopted into UK Policy as the Air Quality Standards Regulations 2007, with separate versions of regulations being published for England, Scotland, Wales and Northern Ireland. These Regulations set out a comprehensive strategic framework within which air quality policy will be taken forward in the short to medium term. The strategy highlights the roles that Government, industry, the Environment Agency, local government, business, individuals and transport have in protecting and improving air quality.

Air Quality Strategy Objectives

The United Kingdom AQS contains air quality Standards and objectives for key pollutants which have been set, taking into account the limit values contained in the fourth Air Quality Daughter Directive (2004/107/EC) limit values for the protection of health.

The AQS Objectives should be assessed in relation to 'the quality of the air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are likely to be regularly present' (DEFRA 2001).

Local Authorities must undertake a Review and Assessment to ensure that levels of AQS pollutants are within objective levels. If these objectives are exceeded, a Local Authority must declare an Air Quality Management Area (AQMA) and produce an Air Quality Action Plan (AQAP) with a view to reducing these levels.

In addition to these objectives for protection of human health, national objectives exist for the protection of vegetation and ecosystems. The AQS states that Government and devolved administrations intend that these objectives will apply in those parts of the UK which are:

- More than 20km from an agglomeration;
- More than 5km away from industrial sources regulated under Part A of the 1990 Environment Act (or PPC);
- Motorways; and
- Built up areas of more than 5000 people.

Due to proposed development site being less than 5km from the M20 motorway the objectives for the protection of vegetation are not relevant to this report.

The strategy objectives for the pollutants considered in this report are shown in

Table 5.1-1. Pollutants for other strategy objectives can be found in The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Volume 1 (2007).

Table 5.1-1:
Relevant Air Quality Strategy Objectives

Pollutant	Standard	Notes	Target year	EU AQ Daughter Directives*
Nitrogen Dioxide	200µg/m^3 (104.6ppb)	1 hour mean, Maximum of 18 exceedances per year	end 2005	200µg/m^3 (105 ppb) one hour mean, exceedances (Jan 2010)
	40µg/m^3 (21 ppb)	Annual mean	end 2005	40µg/m^3 Annual mean, January 2010.
Particles (PM_{10})	40µg/m^3	Annual mean Currently applies to England	December 2004	Annual mean 40 µg/m^3, both by 2005.
	50µg/m^3	24 hour mean, exceedence 35 days per annum	December 2004	24 hour mean 50µg/m^3 maximum exceedance 35 days per year
Particles ($PM_{2.5}$)	25µg/m^3	Annual mean, UK (Except Scotland)	2020	Target value of 25µg/m^3 (2010) (still under negotiation)
	12µg/m^3	Annual mean, Scotland	2020	• Target value of 25µg/m^3 (2015) (still under negotiation)

Local Air Quality Management (LAQM)

LAQM requires local authorities to periodically review and assess the current and future quality of air within their administrative boundary. Where it is determined that an air quality objective is not likely to be met within the relevant time period, the authority must designate an Air Quality Management Area (AQMA).

Every three years local authorities are required to carry out an Updating and Screening Assessment (USA) followed by a Detailed Assessment (DA), where required. The aim of the USA is to identify whether there have been any changes (e.g. new emissions sources or new residential locations) that may now result in an exceedence of the air quality objectives. If this is found to be the case then local authorities are required to carry out a DA for the pollutants of concern in accordance with the latest technical guidance LAQM TG(03).[2]

Dust

Potential health impacts off fugitive dust

A study published by the Department of Health's Committee on the Medical Effects of Air

[2] DEFRA (2003) *Local Air Quality Management Technical Guidance. Part IV of the Environment Act 1995.* LAQM.TG(03) – updated in 2006 with FAQ's and new LAQM Tools.

Pollutants (COMEAP)[3] reviewed literature to determine the possible effects of outdoor air pollutants on cardiovascular disease in the UK. The principal conclusions of the report state that:

- 'clear associations have been reported between both daily and long-term average concentrations of air pollutants and effects on the cardiovascular system, reflected by a variety of outcome measures including risk of death and hospital admissions';
- 'it is our broad conclusion that many of these relationships are causal'; and
- 'It is not possible to be certain which components of the ambient pollution mixture are responsible for these effects but it is likely that fine particles play an important part'.

The particulates that could potentially be generated by the proposed development will mainly be made up of the coarse fraction, >PM_{10} and have limited potential to generate those fractions of PM_{10} associated with potential health effects identified in the literature. It is concluded, therefore, that the potential impact of dust from construction and operational activities, would be limited to potential nuisance impacts and this is what has been assessed in the report.

Potential nuisance impacts of fugitive dust

General

Dust is the generic term used to describe particulate matter in the size range 1-75µm in diameter (BS 6069). The distance from the source to the receptor location plays an important role in the potential dust impact experienced, as both airborne dust and dust deposition rates fall off rapidly on moving away from the source. The very largest particles usually only travel 10-20m before being deposited. PM_{10} particles, on the other hand, are not readily deposited and can travel for longer distances. The vast majority of dust is deposited within 100m of the source.

To allow for this effect of distance, buffer zones are often defined by mineral planning authorities around potentially dusty activities to ensure that sufficient protection is provided. They have not been established in any rigorous scientific way, but usually range from 50m to 200m. The 1995 Department of Environment Guidance, The Environmental Effects of Dust from Surface Mineral Workings, however, recommends a stand-off distance of 100-200m from significant dust sources (excluding short-term sources), although it is recognised that these distances can be reduced if effective mitigation measures are identified and implemented.

The Air Quality Strategy does not cover particles more than 10µm in diameter, the fractions commonly referred to as 'deposited dust' or 'annoyance dust'. Deposition of dust in the community is normally perceived as an accumulated deposit on surfaces such as washing, window ledges, paintwork and other light coloured horizontal surfaces, e.g. car roofs. When the rate of accumulation is sufficiently rapid to cause noticeable fouling, discoloration or staining (and thus decrease the time between cleaning) then the dust is generally considered to be a nuisance. However, the point at which an individual makes a complaint regarding dust is highly subjective. The methodology for assessing nuisance dust in this report is described in detail in Appendix 1 of this report.

In terms of identifying sensitive locations in this assessment consideration has been given to

[3] Cardiovascular Disease and Air Pollution, A Report By The Committee on the Medical Effects of Air Pollutants (COMEAP), February 2006

sensitive receptors within 500/550m (being over double the standoff recommended by DoE) of the boundary of mineral importation activities and the subsequent remediation operations at the proposed Otterpool development.

Odour

Like dust, in the UK there are no statutory standards or objectives for assessing odour nuisance. On this basis, odour impact criteria are typically based upon guidance, published research and case law.

UK Guidance

The Agency has published a number of guidance and research documents relating to odour assessment. These are typically aimed at processes falling under the PPC Act (1999). These include the Horizontal Guidance Notes H4 Parts 1 and 2[4], which are currently at the draft stage.

The IPPC H4 Guidance proposes installation-specific exposure criteria on the basis that not all odours are equally offensive, and not all receptors are equally sensitive. The conditions of a Permit will balance these installation-specific exposure criteria against what is realistically achievable in accordance with the concept of Best Available Techniques (BAT).

[4] Environment Agency / SEPA (2002) Horizontal Guidance IPPC H4.

5.2 METHODOLOGY

General

This assessment has been undertaken in accordance with the latest Agency guidance, EU Directives and British Standards. In cases where no formal guidance is available the methodology used in the assessment has been described and justified within the report.

All recent guidance proposes a staged approach as the basis of all air quality assessments. This requires that the approach taken for the assessment of risk be proportional to the risk of an unacceptable impact being caused. This risk based qualitative approach is contained in the NSCA development control: Planning for Air Quality document with an emphasis given to developing recommendations to reduce air quality impacts. As such, where a simple review of the situation shows that risk is negligible, this will be sufficient. In cases where the risk of a health or nuisance impact cannot be regarded as insignificant, a more detailed assessment may be required (such as a simple quantitative screening assessment or an advanced dispersion modelling exercise as appropriate).

The proposed site has historically been used as a mineral and construction materials processing facility for the purpose of asphalt and ready mixed concrete production, however, the site is currently redundant. Buildings involved with this process have been cleared, however; some concrete pads remain. As such, this situation forms the baseline ('no development') situation for purposes of this air quality assessment. These are to be compared with air quality impacts resulting from the 'with development' scenario. Each of the activities associated with the proposal have been compared against the potential air quality impacts including AQS pollutants from traffic, dust (deposited and suspended), and odour.

Assessment of AQS pollutants

There are two main activities associated with the proposals with the potential to impact on levels of pollutants covered by the AQS. These are the movement of vehicles, and the gas combustion plant. Each is covered in turn below.

Assessment of vehicular pollutants

Although vehicles are likely to emit all of the AQS pollutants, the most significant emissions are NO_2 and PM_{10}.

Like risk assessment for pollutants covered by the Environment Agency guidance documentation, the DEFRA approach involves a staged risk assessment, and is described in Local Air Quality Management LAQM TG(03) and the Design Manual for Roads and Bridges (DMRB) chapter 11.

The method employed to assess the potential impact of vehicular pollutants follows the risk based qualitative approach outlined in the NSCA: Planning for Air Quality Document. This staged assessment involves:

- Initial assessment to determine requirement for quantitative screening;
- Quantitative screening using the DMRB traffic pollutant screening tool; and, if required on the basis of a predicted exceedence of an AQS Objective

- Detailed assessment using an advanced road pollutant dispersion model.

Any predictive modelling only determines the relative contribution to air pollution levels in an

area as a consequence of the traffic flows and vehicle mix. In order to determine the total concentration at the identified receptors, appropriate 'background' concentrations are required to be taken into consideration.

Assessment of pollutants from gas combustion plant

The issue of air quality associated with the proposed development has been considered in the context of the regulatory procedures and the likely implications of the scheme. Following consultation with Kent County Council, the Applicant has been advised that a Pollution Prevention and Control (PPC) permit is necessary for the AD plant and combined heat and power plant elements.

In that respect, the advice offered in terms of the relationship between planning and PPC regimes is set out in PPS23 which deals specifically with the relationship between planning and pollution controls. It advises that the two are "separate but complementary". The planning system relates to development and land-use issues that guide the location of proposals that may give rise to pollution. The pollution control element seeks to prohibit or limit the release of substances to the environment from different sources with particular regard to air and water quality standards that seek to remove the potential effect on the environment and human health.

In accordance with this guidance, the proposed development will comply with environmental limits laid down in PPS23, and designed to comply with the Best Available Technique (BAT). The application for the PPC will include an assessment of air quality issues within the context of pollution control. This will include an assessment of emission rates to comply with background air quality standards for the protection of amenity and human health issues.

The assessment at the PPC application stage will be conducted in accordance with the Environment Agency's Horizontal Guidance Note IPPC H1[5] (H1) and the additional guidance provided by the Air Quality Modelling and Assessment Unit (AQMAU) of the Environment Agency[6]. A screening assessment will be undertaken to determine whether emissions from the proposed AD gas utilisation plant are significant. This will be done using the Tier 1 screening method detailed in H1.

Where required, dispersion modelling of emissions from the gas engines will be undertaken using an appropriate dispersion modelling package.

Dust

A qualitative assessment has been undertaken.

This assessment takes account of:

- buffer distances between sources and receptors;
- prevailing winds; and
- the nature of potentially released dust.

The generation of fugitive dust is particularly dependent upon weather conditions. The prevailing meteorological conditions at any site would be dependent upon many factors including its location in relation to macroclimatic conditions as well as more site specific, microclimatic conditions. Clearly the most significant meteorological factor, in addition to

[5] Environment Agency (July 2003), IPPC Horizontal Guidance Note H1 – Environmental Assessment and Appraisal of BAT.
[6] Environment Agency AQMAU (January 2004), Screening Method for Emissions from Landfill Sites.

rainfall, is the predominant wind direction and wind speeds. As it is the higher wind speeds which will transport dust the largest distance, data has been summarised in relation to the predominant high wind speeds and directions within the development area. A detailed description of the methodology used to assess the potential impact of nuisance dust from the proposed development site can be found in Appendix 1 of this report.

Odour

The assessment of odour follows the standard staged approach as described in the sections above and represents the most appropriate at the time of writing.

Dispersion of odour and ultimately perception of that odour is affected by the meteorological conditions and in particular wind speed and direction. Unlike dust, it is the low wind speeds which are of most relevance when assessing the impact at receptors, and consequently data has been summarised in relation to the predominant low wind speeds and directions within the development area.

The assessment of odour has been conducted by taking into account the sensitivity to odour of each receptor, the nature of potential odour generation, the separation distances and prevailing meteorological conditions at the development site.

The frequencies of winds <3.1m/s that blow from the development site to the receptors has been analysed for each receptor identified. This figure of 3.1m/s has been used as it is these wind speeds that are conducive to creating very stable atmospheric conditions and therefore very poor dispersion of odours as outlined in the Odour Guidance for Waste Sites.[7]

[7] Environment Agency, Odour Guidance – Internal Guidance for the Regulation of Odour at Waste Management Facilities, Version 3.0 (2002).

5.3 LOCATION AND SITE CHARACTERISTICS

Local Air Quality Management (LAQM)

The proposed Otterpool Waste Management Facility will fall within the administrative boundary of Shepway District Council (SDC). Throughout the air quality review and assessment process carried out within the district it was concluded that there was no requirement to declare an air quality management area (AQMA).

Background air quality

The background air quality in the area has been derived from the DEFRA background pollutant database (www.airquality.co.uk) and corrected for the relevant years using the methodology set-out in DEFRA Technical Guidance LAQM TG(03)[8] (presented in Table 5.3-1 below).

The predicted concentrations of relevant pollutants are currently below the air quality objectives.

Table 5.3-1:
Background Pollutant Concentrations

• Pollutant	• 2007 (Annual mean µg/m3)
• Nitrogen Dioxide (NO_2)	• 16.1
• Particulate Matter (PM_{10})	• 17.3

Highways

The baseline and development situations relating to Highways and Infrastructure are discussed in detail in the Transport Assessment.

Receptors

The proposal site is surrounded by agricultural land in all directions with the East Stour River located 300m to the north of the site.

The northern boundary of the site is fixed by the A20 Ashford Road. Barrowhill is located approximately 500m to the north northwest of the site with Lympne Industrial Park and Lympne Village approximately 1km to the south and south east respectively.

Sensitive locations are those where the public may be exposed to AQS pollutants, dust, odour, etc arising from the site. For purposes of assessment, seven potentially sensitive receptor locations have been identified on the basis of standoff distance referred to in section 0. Receptor locations can be seen in Drawing AQ1. Although these are not the only receptors in the area; the closest receptors to the proposed development in each direction have been selected to allow for a representative cross-section to be assessed. Distances are to the development site and locations where operations will take place (and therefore potential sources) and not the site boundary.

[8] DEFRA (2003) *Local Air Quality Management Technical Guidance. Part IV of the Environment Act 1995.* LAQM.TG(03).

Table 5.3-2:
Potentially Sensitive Receptors

Receptor	Description	Sensitivity	Distance from proposal site (m)	Direction from site
Transport Café	Commercial	Medium	30	358^{o}
Barrow Hill Farm Cottages	Residential	Medium	220	320^{o}
Barrow Hill Farm	Agricultural / Residential	Medium	550	328^{o}
Otterpool Manor	Residential	Medium	140	270^{o}
Upper Otterpool	Residential	Medium	230	179^{o}
Red House Farm	Agricultural / Residential	Medium	520	94^{o}
Mink Farm	Residential	Medium	230	70^{o}

Note: Distances are to the development site and operational areas (and therefore potential sources) and not the site boundary.

Meteorological Conditions

The most important climatological parameters governing the atmospheric dispersion of pollutants are as follows:

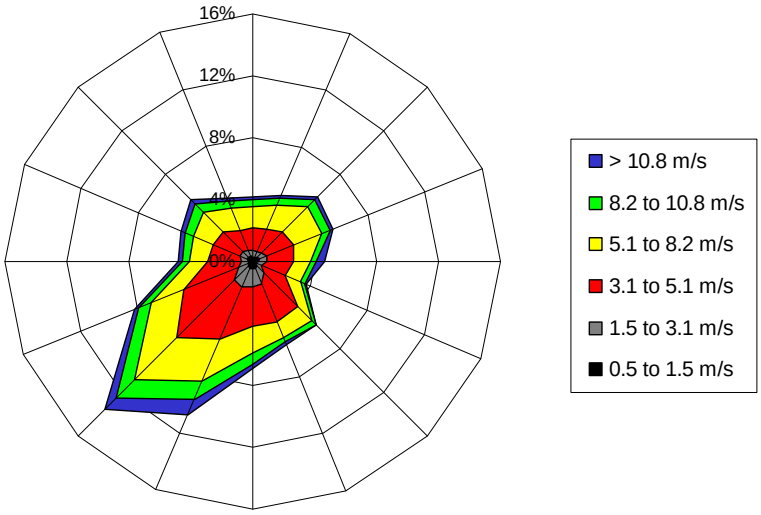
- wind direction determines the broad transport of the emission and the sector of the compass into which the emission is dispersed;
- wind speed will affect ground level emissions by increasing the initial dilution of pollutants in the emission; and

- atmospheric stability is a measure of turbulence, particularly of the vertical motions present. Unstable conditions involve very convective conditions with large vertical motions, while stable conditions are when vertical motion, and consequently mixing (and dispersion), is suppressed.

Data for five years has been obtained from a meteorological observing station at Manston, located approximately 38 km to the north east of the Otterpool development site. This is the closest meteorological station to the proposed development site and is the most appropriate to use for this assessment. Information on wind direction frequency and wind speed were obtained for the site. A windrose for the Manston observing station for the period 1994 to 1998, providing the frequency of wind speed and direction, is presented in

Figure 1.

Figure 1:
Windrose for Manston Observing Station (1994 to 1998)



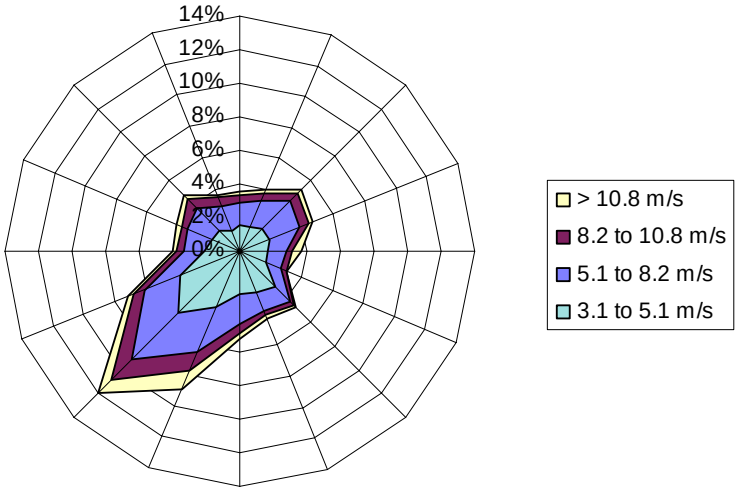
The predominant wind direction is from the south western quarter (with winds from the south west, occurring for approximately 13.5% of the time). Wind directions from the north occur relatively infrequently.

Dust and wind conditions

With dust impacts, the proportion of higher wind speeds is of concern because this enables particles to become airborne.

At the proposed Otterpool Waste Management Facility, the majority of winds >3.1 m/s are from a south westerly direction at 11.8% of the time. On this basis, it is locations to the north east which have the highest potential for impact from dust originating from the site. It can be seen that winds >3.1m/s account for 82.5% of total winds over the year.

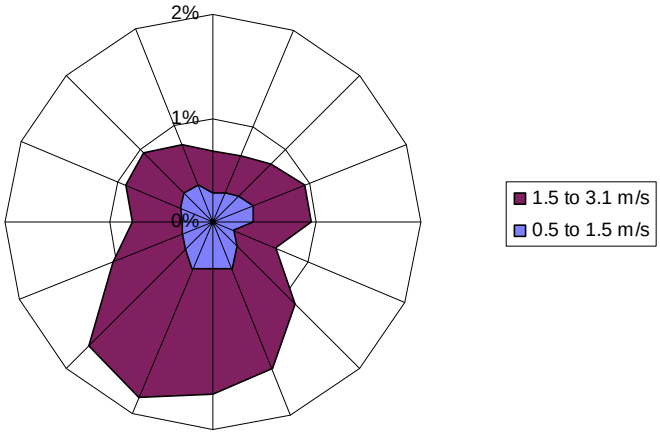
Figure 2:
Wind Speeds > 3.1m/s – Manston Observing Station (1994 to 1998)



Odour and wind conditions

For odour impacts, the proportion of lower wind speeds is of concern as dispersal of odours is minimised. The frequency of wind speeds <3.1 m/s, likely to exacerbate odour nuisance problems, is presented in Figure 3. These conditions occur for 17.0% of the time and the predominant wind direction under these conditions is from the south southwest.

Figure 3:
Wind Speeds< 3.1m/s - Manston Observing Station (1994 to 1998)



A summary of other climate conditions applicable to the site is available for an observing station which is located at Wye. The station is located at a height of 56m AMSL (above mean sea level) approximately 14km to the north northwest of the proposal site. This is the nearest observing station to the application site where a summary of average rainfall data are provided by the Meteorological Office. A summary of monthly average rainfall from 1971 to 2000 are presented in

Table 5.3-3.

Table 5.3-3:
Summary of Meteorological Observations at Wye
(1971 to 2000 Averages)

Month	Rainfall	Days with >1.0mm Rain
Jan	72.0	12.6
Feb	44.7	9.3
Mar	53.5	10.0
Apr	50.8	9.1
May	45.3	8.9
Jun	51.8	8.6
Jul	47.1	6.8
Aug	55.9	7.2
Sep	65.3	8.7
Oct	85.4	11.3
Nov	78.7	11.6
Dec	77.3	12.0
Year	727.9	116.1

The data shows that higher rainfall generally occurs between the months of September to January. The total annual average rainfall for the thirty year period was 727.9mm and rainfall greater than 1mm occurred on 32% of days of the year.

Topography

The site lies at 78m above ordnance datum (AOD). 1km to the south of the site the land rises to a height of 105m AOD. Land to the west, north and east remains relatively flat.

The presence of elevated terrain can significantly affect ground level concentrations of pollutants emitted from elevated sources, such as stacks, in a number of ways. Elevated terrain reduces the distance between the plume centre line and the ground level, thereby increasing ground level concentrations. Elevated terrain can also increase turbulence and, hence, plume mixing with the effect of increasing concentrations near to a source and reducing concentrations further away. Considering the relatively flat terrain of the site, topography is unlikely to have a significant effect on dispersion of potential emissions.

5.4 ASSESSMENT OF IMPACTS, MITIGATION AND RESIDUAL EFFECTS

This chapter provides assessment of each of the potential impacts as identified in the formal scoping process.

Dust

Comparison with baseline situation

Aspects of the development proposal (described in detail in the application supporting statement) which will have the potential to generate dust beyond that which would be expected for the baseline situation are described below.

Construction activities associated with the proposal have the potential to give rise to dust emissions which would deposit beyond the boundary of the site. Specifically the site preparation (e.g. movement of earth, short term stockpiling) for concrete bases, construction and fabrication processes (e.g. cutting, grinding, drilling etc), and vehicle movements on haul roads.

During the operational phase of the development dust emission may be generated by the following:

- receipt of waste on the floor of the enclosed MRF reception area and the loading of waste into the feed hopper by mechanical shovel;
- the removal of residual waste after recyclate recovery by transfer via loading shovel into site vehicles;

- receipt of waste within the enclosed AD plant building;
- the storage of the dewatered AD digestate on concrete pads contained within an open fronted building, for maturation; and

- vehicle movements on haul roads.

Proposed Activities

The site preparation (soil removal, stock piling etc) and use of haul roads associated with the construction phase are considered to present the greatest potential for dust generation. The potential nuisance impact from these sources is limited by the fact that dust is not likely to be raised when the ground is damp, it is therefore appropriate to focus on dry days for the assessment, which account for around one third of the days in a year. The construction phase is expected to take approximately 12-18 months, therefore potential for nuisance impact will be for a limited duration and likely to be limited to the drier months in this period.

During the operational phase of the proposal, the receipt and handling of waste is considered to present a relatively low potential for dust generation due to the low dust content and relatively high moisture content of the waste types that would be received at the site. Consequently, the potential nuisance impact is considered to be low.

Vehicle movements are considered to have greatest potential for the generation of dust. As above the potential nuisance impact from these sources is limited by the fact that dust is not likely to be raised when the ground is damp.

For all sources, the creation and subsequent dispersion of dust will be highly dependent on the weather conditions.

Potential impacts (without mitigation)

The wind rose presented in Figure 2 for Manston illustrates that wind speeds of above 3.1 m/s occur for 82% of the 5 year period. A wind speed of 3.1m/s has been used as the level at which winds are strong enough to suspend particles and potentially transport them beyond the site boundary. Wind speeds below this, 1.5 to 3.1m/s, are considered too low to be able to do this. The distance from various dust generating activities and approximate frequency of wind speeds carrying airborne particles to the selected potentially sensitive receptors from these activities is presented in Table 5.4-1.

Table 5.4-1 represents wind speeds for the entire year. The frequency of high wind speeds has been adjusted to account for the 32% of days of the year with rainfall >1.0mm. This is a conservative adjustment as days with rainfall greater than 0.2mm are considered sufficient to effectively suppress wind blown dust emissions[9].

This data has been used to conduct a risk based screening exercise. The full methodology and results of this are included in appendix 1 of this report. A summary of the outcome is presented below in Table 5.4-1, showing the risk of dust impacts. The risk evaluation for potential dust impacts at each site represents a scenario of operations at the site where no control or mitigation methods have been employed.

Table 5.4-1:
Frequency of Wind Directions and Risk Assessment

Receptor (drawing AQ1)	Location Relative to Site		Frequency of Wind Speeds (>3.1m/s) (%)	Frequency of Wind Speeds (>3.1m/s) (%) Amended for Dry Days Only	Risk Evaluation
Transport Café	30m	358^{0}	9.6	6.5	Unacceptable
Barrow Hill Farm Cottages	220m	320^{o}	8.9	6.1	Acceptable
Barrow Hill Farm	550m	328^{o}	12.0	8.2	Insignificant
Otterpool Manor	140m	270^{o}	9.7	6.6	Unacceptable
Upper Otterpool	230m	179^{o}	7.1	4.8	Acceptable
Red House Farm	520m	94^{o}	4.0	2.7	Insignificant
Mink Farm	230m	70^{o}	11.2	7.6	Acceptable

Locations considered of high sensitivity to dust emissions include hospitals and clinics, high-tech industries, painting, furnishings and food processing. Locations classed as being moderately sensitive include schools, residential areas and food retailers. On this basis the receptors selected above (i.e. residential properties) are considered to be of medium

[9] http://www.goodquarry.com/article.aspx?id=55&navid=2#dustemission (October 2007).

sensitivity to nuisance dust impacts.

The risk screening assessment has highlighted that two of the sensitive receptor locations are exposed to an unacceptable risk from potential dust emissions from the site without dust mitigation measures in place. These are the Transport Café and Otterpool Manor, located at a distance of 30m and 140m from the proposed operations respectively.

Proposed mitigation

The proposal includes the following mitigation measures to control emissions of dust:

- Dust from haul roads: adequate quantities of water will be stored on site such that road surfaces can be conditioned by damping with a bowser to ensure that dust emissions due to vehicle movements are minimised during the construction phase. Paved haulage routes will be used during the operational phase of the development and as a result there will be minimal potential for dust to be generated through vehicle movement;
- Dust from receipt and handling of residual waste: the waste is not a significant dust source (as described above), however, potential dust emissions will be mitigated by the enclosure of operations within a building to minimise the potential for the pick-up and dispersion of any dust; and

- Storage of digestate material for maturation: the storage pad will be enclosed within an open fronted building to reduce the risk of dust generation during unfavourable conditions.

Measures that are available for minimising dust emissions are summarised in Table 5.4-2 along with the estimated effectiveness of the measures proposed.

Table 5.4-2:
Summary of Recommended Dust Control Measures

Site Operation	Dust Control Measures	Comparative Effectiveness	Estimate of
Waste reception and handling	Enclosure within building		• High
Access & Internal Roads	Paved site roads between highway/vehicle reception/waste reception area		• High
	Roads to be regularly maintained by sweeping to minimise dust generation (if necessary)		• High
	Speed controls to be implemented and enforced on all haul routes during construction phase (15 – 20 mph)		• Moderate
	Water bowsers to be used as required		• High
Storage of digestate	Contained within an open fronted building		• High

These methods for control of particulate matter at waste facilities are consistent with those proposed in Environment Agency M17 guidance (section 3.3, page 16).

Residual Effects

Despite the relatively small separation distances between the proposed operations and these two receptors, the dust mitigation measures outlined in Table 5.4-2 will reduce any potential impact to within acceptable levels. Additionally, the mature vegetation surrounding the site, especially that which is located between the Transport Café and the site will act to further reduce the potential dust impacts from on site operations. The effect that vegetation can have on reducing dust has been illustrated by S.K. Chaulya et al (2001)[10]. The frequencies of unfavourable winds towards the Transport Café and Otterpool Manor, during dry conditions, at 6.5% and 6.6% of the time respectively, are relatively low. This equates to winds that are capable of carrying airborne dust blowing toward the receptors for 24 days of the year.

The construction activities have the largest potential for dust generation and these will be limited to a short period during the building of the plant, the day to day operations of the plant will have limited potential to generate dust.

Summary

It is considered that, with the effective management of activities, and the implementation of mitigation measures, the potential for the generation of significant quantities of dust is minimised and for the majority of the sensitive receptors identified, the prevailing wind speeds and directions, relatively large separation distances, would ensure the potential of dust emissions from the proposal to give rise to dust nuisance is negligible.

Odour

Potential impacts

The aspects of the proposal which will have the potential to generate odour are limited to the operational phase and are as follows:

- receipt of waste on the floor of the reception area;
- handling and screening of waste in the MRF plant;
- treatment of organic fines in the AD plant building;
- displacement of air from buffer tanks associated with sludge thickening and pulping;
- the digestion process;
- the dewatering of the digested slurry;
- the storage of the dewatered AD plant product (digestate) on concrete pads contained within an open fronted building for maturation; and

- the water treatment/recycling process.

Potential impacts (without mitigation)

The fresh waste received at the reception area of both the MRF and AD buildings is likely to be significantly less odorous than waste further down stream in the treatment process such as organic fines sludge. This is because due to the age of the waste there is limited potential

[10] S.K. Chaulya et al, Air Pollution Modelling for a Proposed Limestone Quarry, Waster, Air and Soil Pollution 126: 171-191,2001.

for the onset of the microbiological activity associated with the generation of offensive odours. Consequently, considering the limited potential for odour generation from this source this is unlikely to lead to a significant impact.

Potential odour generation from the AD process and associated process stages housed within the AD facility building are considered the sources of greatest risk. Without mitigation (described below) it is likely that odour would be perceived at one or more receptor locations.

After a 15-20 days residence time in the digestion tanks the digester residue is removed from the tanks to a screw press. This separates the substrate into press cake and press water. The storage of the dewatered digested sludge will have low potential for odour generation. This is due to the fact that the readily putrecible faction of the waste will have been removed by the digestion, pasteurisation and stabilisation processes. During this storage phase the material will be kept in an aerobic state, prior to use and thus the potential for odour generation is limited. Consequently, considering the limited potential for odour generation from this source it is unlikely to lead to a significant impact.

The water removed from the digester residue is treated and recycled to minimise the water consumption associated with operating the AD plant. The technology used to treat the water will be contained within the main AD process building but this process will have the potential to generate odour without the use of mitigation. The wind rose presented in Figure 3 for Manston illustrates that wind speeds of below 3.1 m/s occur for only 17.0% of the 5 year period. Wind speeds below 3.1m/s have been used in the assessment as these are conditions that are most likely to create stable atmospheric conditions conducive to poor dispersion and the occurrence of odour nuisance, as outlined in section 0. The distance from the proposal and approximate frequency of wind speeds carrying odours to the selected sensitive receptors from these activities is presented in Table 5.4-3.

Table 5.4-3
Frequency of Wind Directions Towards Identified Receptors

Receptor (drawing AQ1)	Location Relative to Site		Frequency of Wind Speeds (<3.1m/s) (%)
Transport Café	30m	358^{o}	3.2
Barrow Hill Farm Cottages	220m	320^{o}	2.6
Barrow Hill Farm	550m	328^{o}	3.2
Otterpool Manor	140m	270^{o}	1.7
Upper Otterpool	230m	179^{o}	1.5
Red House Farm	520m	94^{o}	0.8
Mink Farm	230m	70^{o}	1.8

Proposed mitigation

The proposal includes designed in mitigation measures to minimise the release of odour from the sources identified as presenting a potential risk of impact. The mitigation measures are as follows:

- transfer of organic fines from the intermediate storage bunker to the blending unit via an enclosed system;
- the full enclosure of the AD process from initial reception to digestate residue

treatment in the pre maturation stage;
- extraction of air from the AD process buildings to maintain negative pressure within the buildings;

- treatment of extracted air by a biofilter;
- all air displaced from buffer tanks will be passively vented to the biofilters;
- all digesters will be fully enclosed and all 'off gas' will be extracted for utilisation purposes;

- containment, extraction and effective odour abatement treatment of air from the process water treatment unit; and

- the housing of the digestate material during the maturation phase within an open fronted building.

The combination of containment and treatment, detailed above, will ensure that the potential releases of odour from these sources will be fully mitigated. Back-up systems and operational management will ensure that this mitigation remains at maximum efficiency at all times. As a result the odour assessment below considers these sources to be fully abated and assesses the risk of impact from the sources which are not fully abated, i.e. stored digestate. A summary of odour control measures is shown in Table 5.4-4.

Table 5.4-4:
Odour Control Measures

Activity and/or Source	• **Mitigating Measures**
Reception area of MRF and AD facilities	Containment within process buildings and extraction to biofilter
Sorting and movement of materials at MRF/AD	Containment within process buildings and extraction to biofilter
Organic fines pre-processing and storage	Containment and extraction to biofilter
Digesters	Containment and extraction to combustion plant
De-watering process	Containment and extraction to biofilter
Storage of digestate	Housed within an open fronted building
Process water treatment	Containment and extraction to biofilter

Residual effects

The receptors that will be most frequently affected by unfavourable winds from the proposal site are the Transport Café and Barrow Hill Farm at 3.2% of the time. Barrow Hill Farm is a significant distance from the proposal site; at 550m and even in conditions of limited dispersion, the low odour emissions predicted from storage of the digestate are very unlikely to cause an impact at this receptor. The Transport Café is significantly closer to the proposed operations. The frequency of unfavourable winds of 3.2% of the time equates to 11.6 days of the year. The most stable conditions frequently occur during the night, therefore, due to the nature of activities at this receptor, no relevant exposure will occur at this location during night time hours. Activities at this receptor also mean that members of the public are unlikely to be at the site for long periods of time which will further reduce the potential for odour nuisance to occur. When this is combined with the limited potential for odour generation from the storage of digestate material within the open fronted building and effective mitigation measures applied to the other potentially odorous operations at the site it is considered that the potential of a nuisance odour being experienced is low. Otterpool

Manor is the next closest receptor to the proposed site at 140m, however, it will only be affected by low wind speeds from the site for 1.7% of the time and therefore the impact at this receptor is considered to be negligible. All other receptor locations are affected by winds from the proposal site for less than 3% of the time and are in excess of 220m distant. Therefore the impact at all receptor locations is predicted to be negligible when considering the limited potential for odour generation from the proposed development.

Vehicular Pollutants

Assessment context

A full description of the Traffic and Transportation aspects of the proposal are included in the Traffic and Transport Assessment.

Current traffic flows on surrounding roads

The application site is currently not in use and therefore generates no traffic flows. The site was used up until 2001 as a mineral and construction materials processing facility. Despite there not being any traffic flow data available from this period, experience of similar sized sites suggests that a sizable number of HGV movements would have been generated by this operation.

Potential impacts

It has been predicted that at maximum operating capacity the development proposals would generate approximately 76 HGV loads (152 movements) per weekday. In addition to this it is predicted that a small number of light vehicle movements will be generated, principally by staff and visitors. It has been anticipated that a maximum of 25 staff will be based at the site and when combined with vehicles servicing the site a maximum of 40 light vehicle trips (80 movements per day) will be generated.

The HGV movements will be spread evenly throughout the day and the operational hours of the site will mean that most light vehicle movements will occur outside of peak traffic hours. Therefore it is considered that traffic flow speeds will not be affected by vehicle movements generated by the proposed site operations.

Vehicle movements during the construction phase of the development are likely to be considerably less that those predicted during the operational phase.

The design Manual for Roads and Bridges[11] outlines a multi stage approach to assessing the potential impacts of vehicle combustion emissions associated with proposed development. The first of the four assessment levels is a scoping assessment. This requires that roads likely to be affected by the proposed development are identified. Affected roads are any of those that meet the following criteria:

- Road alignment will change by 5m or more; or
- Daily traffic flows will change by 1,000 AADT or more; or
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
- Daily average speeds will change by 10km/hr or more; or
- Peak hour speed will change by 20km/hr or more.

[11] Design Manual for Roads and Bridges, Volume 11, Section 3 Environmental Assessment Techniques, Part 1, Air Quality (May 2007)

From the predicted traffic flow data associated with the proposed development it can be seen that none of the roads in the vicinity of the area are classed as being affected by the proposed development. As a result there is no requirement to progress to a second stage of assessment for traffic emissions.

On this basis it can be concluded that the proposal will make no significant difference to levels of pollutants at the roadside of the main approach road and levels are predicted to remain significantly below AQS Objectives.

5.5 SUMMARY AND CONCLUSIONS

A comprehensive air quality assessment of the proposed development at Otterpool Quarry has been undertaken in accordance with Defra and Environment Agency guidance. The assessment has focussed on the principal emissions to air, including:

- Air Quality Strategy Pollutants from vehicles;
- Dust, Assessment of Health and Nuisance Effects; and
- Odour.

The assessment has included: a qualitative assessment of potential odour nuisance and dust impact. A screening assessment for the potential impact of emissions from associated vehicle movements on local roads and the potential health effects of particulate matter have also been carried out.

Due to the nature of the airborne dust particles (coarse particles) that would be generated by the proposed development, the on-site activities are not considered likely to result in a detrimental impact on health off-site due to dust emissions. The risk of impact due to dust is primarily mitigated by the buffer distance between sources and sensitive receptors. Also important are the mitigation measures for reducing dust emissions and the fact that the proposed operational activities have limited potential to generate dust at the site. It is considered that the risk of off-site impact (dust nuisance) during construction, operation, and post-closure phases would be negligible.

Odours may arise during the reception and treatment of waste from the organic fines sludge processing activities, the digesters, and the dewatering process. For this reason the proposal includes designed in mitigation measures, incorporating measures to contain, extract, and treat odorous air in specifically dedicated odour abatement plant (biofilters). These measures are designed to ensure that the potential impact from these sources is reduced to a negligible level.

Odours may also arise during the reception and screening of waste, during the waste recycling/transfer process and during the storage of digestate. However due to the low level of odour predicted from these sources and the containment and treatment of all of the main potential odour sources, the potential impact from these sources is considered to be negligible.

Combustion of biogas generated by the AD plant at the site represents best-practice with respect to minimising the emission of gases with global warming potential from anaerobic digestion plants and generating renewable energy. The design and operation of the gas utilisation plant would be regulated by a PPC permit issued by the Environment Agency which would include the specification of emission limits for the gas utilisation equipment in order to minimise the potential of off-site health effects. A full assessment of pollutant emissions associated with the gas plant would be carried out as part of the PPC permit application.

A Stage 1 screening assessment has been undertaken to investigate the potential risk due to traffic associated with the development on local roads. The Stage 1 screening showed that predicted traffic movements associated with the proposed development were not significant and that they did not require assessment using the DMRB screening methodology.

The health and environmental effects of the management of municipal solid, and similar, wastes has been assessed on behalf of DEFRA. This study, the results of which were

published in May 2004, concludes that “present day practice….has at most a minor effect on human health and the environment”. The assessments of potential effects on air quality arising from the proposals at Otterpool are consistent with this finding.

5.6 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Countrystyle Recycling Ltd; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

Appendix 1: Risk Screening Assessment

Table App 1-1:
Risk Screening Matrix

Receptor Ref.	Sensitivity	Distance From Site	% Winds >3.1m/s from site	% Winds >3.1m/s (dry days only)	Distance Rank	Exposure Rank	Total	Risk Evaluation
Transport Café	30m	358^{0}	9.6	6.5	6	3	18	Unacceptable
Barrow Hill Farm Cottages	220m	320^{o}	8.9	6.1	4	3	12	Acceptable
Barrow Hill Farm	550m	328^{o}	12.0	8.2	1	3	3	Insignificant
Otterpool Manor	140m	270^{o}	9.7	6.6	5	3	15	Unacceptable
Upper Otterpool	230m	179^{o}	7.1	4.8	4	2	8	Acceptable
Red House Farm	520m	94^{o}	4.0	2.7	1	1	1	Insignificant
Mink Farm	230m	70^{o}	11.2	7.6	4	3	12	Acceptable

Dust Assessment Methodology

The methodology applied in the assessment is a qualitative risk assessment methodology, in which the probability of an impact occurring and the magnitude of the impact, if it were to occur, are considered. This approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the development.

The magnitude of the potential risk at each receptor is classified depending on the frequency of exposure and the distance from the site to the receptor. Frequency of exposure is represented by the percentage of moderate to high winds (over 3.1m/s) from the direction of the site.

The screening assessment tool assesses the significance of the distance from site and the frequency of exposure of each receptor by assigning a ranked number. Receptors with a higher potential for dust impacts would therefore result in a higher value whilst receptors with lower potential would expect to carry a lower value. The value corresponding to an evaluation of risk is a product of the significance of the distance and frequency of exposure, each assigned a value representing its significance. The multiplication of the two values assigned gives a total, which is then corresponded to a qualitative term of risk magnitude.

Frequency of Exposure Criterion

The potential for any site to emit dust is greatly influenced by weather. Increased wind speed increases the potential for the generation of airborne dust due to the suspension and entrainment of particles in an airflow. A worst case situation would be strong, warm, drying winds which increase the rate at which dust is lifted from an untreated surface and emitted into the air. Wind can also have the effect of spreading dust over a large area. Conversely, rainfall decreases dust emissions, due to both surface wetting and increasing the rate at which airborne dust is removed from air. An article on dust generation from quarry operations[12] suggests that rainfall of greater than 0.2mm per day is considered sufficient to effectively suppress wind blown dust emissions.

The frequency of exposure to dust emissions represent the percentage of time that wind speeds capable of carrying airborne dust (greater than 3.1m/s) are blowing from the proposed development to the direction of the receptor. Frequencies have been calculated based on meteorological data for five years at Manston Observing Station. The frequency of exposure at this point provides an overestimate or risk given that during days of rainfall no dust emissions would occur despite wind speed values.

For the screening assessment, a value of 1mm has been used for the criteria to classify days as ‘dry’ or ‘wet’, five times the recommended value. using annual average rainfall data for the period 1971 to 2000 at the Wye Observing Station. The average number of days when rainfall exceeds 1.0mm is given for each month, and calculated over the year is an average of 32%.

The resulting frequency of moderate to high wind speeds with the potential of carrying airborne dust towards receptors are classified into the criteria in Table 1, with the respective rank value assigned.

[12] Leeds University. Good Quarry. http://www.goodquarry.com/article.aspx?id=55&navid=2

Table 1:
Frequency of Exposure - Risk Classification

Risk Category	Criteria
1	Frequency of winds (>3.1m/s) from the direction of the proposed development on dry days are less than 3%
2	The frequency of winds (>3.1m/s) from the direction of the proposed development on dry days are between 3% and 6%
3	The frequency of winds (>3.1m/s) from the direction of the proposed development on dry days are between 6% and 9%
4	The frequency of winds (>3.1m/s) from the direction of the proposed development on dry days are between 9% and 12%
5	The frequency of winds (>3.1m/s) from the direction of the proposed development on dry days are between 12% and 15%
6	The frequency of winds (>3.1m/s) from the direction of the proposed development on dry days are greater than 15%

Distance to Source Criterion

In assessing dust impacts, the distance from the source to the sensitive location is crucial, as airborne and deposited dust tend to settle out close to the emission source. Smaller dust particles remain airborne for longer, dispersing widely and depositing more slowly over a wider area.

Guidance indicates that larger dust particles (greater than 30µm) will largely deposit within 100m of sources. Intermediate sized particles (10 - 30µm) are likely to travel up to 200 - 500m. Smaller particles (less than 10µm) are only deposited slowly. Concentrations decrease rapidly on moving away from the source, due to dispersion and dilution.

To allow for this effect of distance, buffer zones are often defined by mineral planning authorities around potentially dusty activities to ensure that sufficient protection is provided. They have not been established in any rigorous scientific way, but usually range from 50 to 200m. The 1995 DoE Guidance on dust from surface mineral workings, however, recommends a stand-off distance of 100-200m from significant dust sources (excluding short-term sources), although it is recognised that these distances can be reduced if effective mitigation measures are identified and implemented. In terms of identifying sensitive locations therefore, and to represent an extreme worst case scenario, consideration only needs to be given to sensitive receptors within 500m of the site boundary.

The criteria for classifying the distance from receptor to source and thus assigning a rank value has therefore been based on the various references to dust behaviour described above. The rank classifications are presented below in Table 2.

Table 2:
Distance to Source - Risk Classification

Risk Category	Criteria
1	Receptor is more than 500m from the dust source
2	Receptor is between 400m and 500m from the dust source
3	Receptor is between 300m and 400m from the dust source
4	Receptor is between 200m and 300m from the dust source
5	Receptor is between 100m and 200m from the dust source
8	Receptor is less than 100m from the dust source

Sensitivity of Receptors

Sensitive locations are those where the public may be exposed to dust from the site. Locations with a high sensitivity to dust include hospitals and clinics, hi-tech industries, painting and furnishing and food processing. Locations classed as being moderately sensitive include schools, residential areas and food retailers. Table 3 below[13] shows examples of dust sensitive facilities.

Table 3:
Examples of Dust Sensitive Facilities

High Sensitivity	Medium Sensitivity	Low Sensitivity
Hospitals and clinics	Schools and residential areas	Farms
Retirement homes	Food retailers	Light and heavy industry
Hi-tech industries	Greenhouses and nurseries	Outdoor storage
Painting and furnishing	Horticultural land	
Food processing	Offices	

Evaluation of Risk

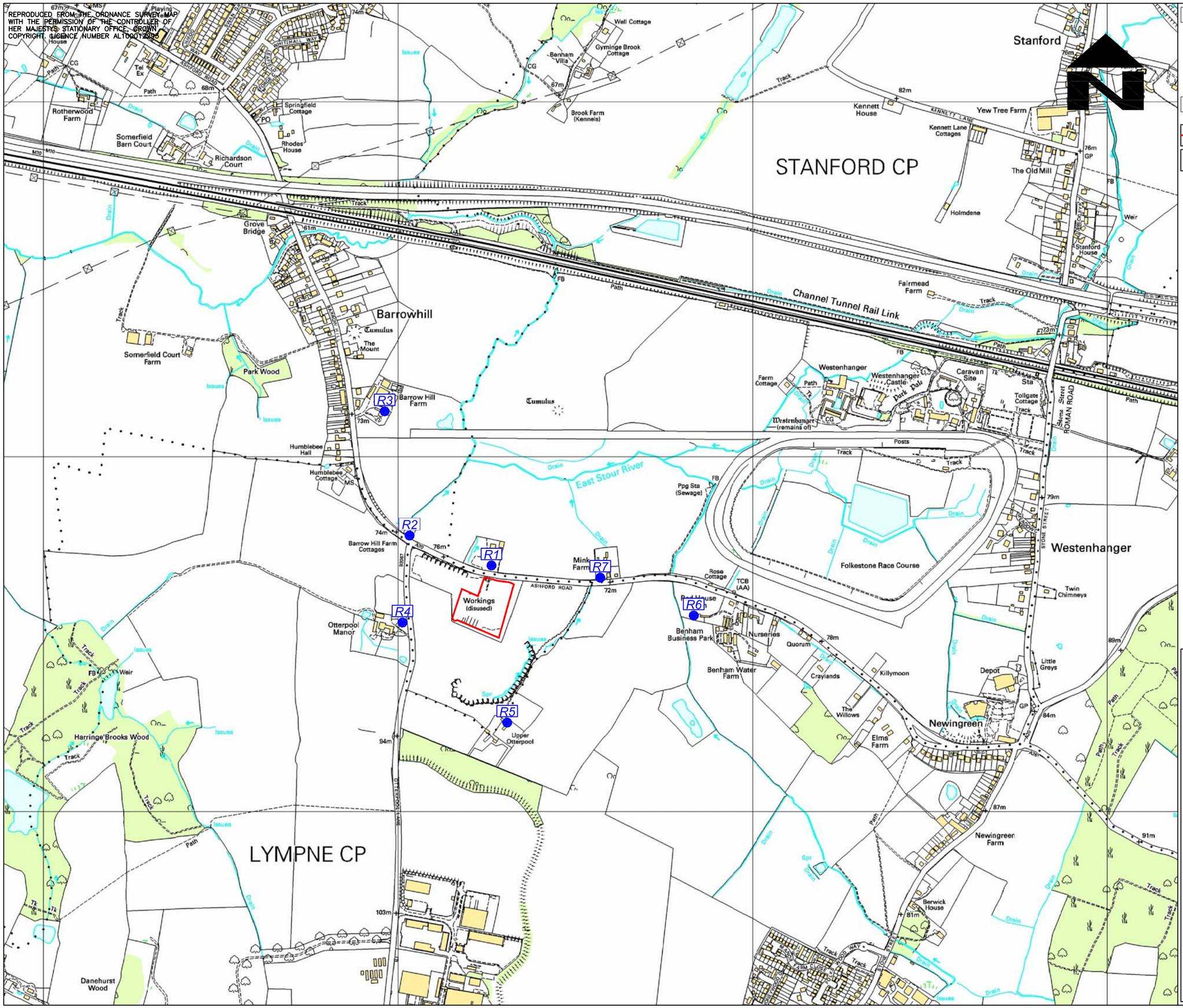
Once a rank value has been assigned to the frequency of exposure and distance to source, an overall risk can be evaluated by combining the two risk categories, along with consideration of the sensitivity of the receptor. For low sensitivity receptors the risk of dust impact are considered to be significantly lower than for medium and high sensitive receptors. Therefore a factor of 0.5 is applied to the final risk evaluation ranking.

For each receptor, the relative magnitude of risk is given by identifying which of the score categories in Table 4 it falls into. This final evaluation represents the risk of dust impacts prior to control and mitigation measures being employed on site.

Table 4
Risk Evaluation Ranking

Magnitude of Risk	Score
Insignificant	6 or less
Acceptable	8 to 12
Requires mitigation or further assessment	15 or more

[13] Ireland M. (1992) "Dust: Does the EPA go far enough?", Quarry Management, pp23-24.



NOTES

LEGEND

PROPOSED DEVELOPMENT SITE

RECEPTOR LOCATIONS

Revision	Issue Date	Issued By	Comments
0	OCT 07	RC	.

Site: OTTERPOOL AD & MRF DEVELOPMENT

Project: AIR QUALITY ASSESSMENT

Drawing: **Air Quality Receptors**

Date: OCTOBER 2007

Drawing No.: **AQ1**

Scale: 1:10,000

Paper Size: ISO A3 AQ1_409-1376-00002_0_AQ 402KL

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Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 6 – Noise Assessment

SLR Ref 409.1376.00002

COUNTRYstyle RECYCLING

WASTE MANAGEMENT SOLUTIONS

December 2007

solutions for today's environment

CONTENTS

APPENDICES

6.0 INTRODUCTION

Countrystyle Recycling Limited has appointed SLR Consulting Limited to undertake a noise assessment to assess the potential impact from the proposed development at Otterpool Quarry in Sellindge, Kent.

This noise assessment has been conducted in accordance with the policies of Kent County Council and is based on the results of an environmental noise survey.

Where required, outline mitigation measures are recommended to ensure that the likelihood of complaint from nearby residential receptors is minimised.

Whilst every effort has been made to ensure that this report is easy to understand, it is technical in nature; to assist the reader, a glossary of terminology is included in Appendix A.

6.1 SITE DESCRIPTION

6.1.1 Existing Site Conditions

The proposed development site is Otterpool Quarry in Sellindge, Kent. The site is a redundant mineral and construction materials processing facility.

The site is bounded to the north by the A20 Ashford Road with the Channel Tunnel Rail Link and the M20 motorway beyond; to the east by open fields and isolated residential properties; to the south by open fields and the Lympne Industrial Park beyond and to the west by Otterpoole Lane and open fields beyond.

There are a number of isolated residential properties in the area around Otterpoole Quarry which are detailed further in Section 4 of this report.

6.1.2 Proposed Site Conditions

The development proposals include the following:

- an anaerobic digestion (AD) plant building;
- a materials recycling/transfer station (MRF); and
- a finished product building.

It is understood that the site will operate from 07:00 to 17:00 hours Monday to Friday and 07:00 to 13:00 hours on Saturdays. The AD plant will operate for 24 hours a day, seven days a week.

6.2 GUIDANCE

6.2.1 Kent County Council

The *Kent Waste Local Plan* was adopted in March 1998. The local plan states in Policy W10 *Composting and Digestion*:

> *"Proposals for composting and digestion plant will be permitted subject to their satisfying the following criteria:*
>
> *(b) that the proposal would not cause significant harm to residential amenities due to noise, dust, smell or visual impact."*

In Chapter 6 *Operational Criteria for the Assessment of Planning Applications for Waste Management* of the local plan it states:

> *"6.3.2 Noise can be an important factor in determining the acceptability or otherwise of waste management proposals. The main impacts are likely to be from vehicle movements and from plant/machinery operating on site. If a proposal is likely to affect existing or committed noise sensitive development then it will need to be supported by a noise impact study to demonstrate that the operations proposed will not lead to an unacceptable loss of local amenity. The study will include details of sources, background levels, and measures proposed to reduce noise levels. Wherever necessary suppression or insulation measures will be required, and maximum permissible noise levels set. If in the opinion of the Planning Authority noise cannot be held at these levels, then permission will be refused.*
>
> *6.3.3 The planning system cannot control all aspects of noise generation. Some fall to other systems (eg environmental health legislation). However, within the limits of the planning system, noise control measures sought will include, as necessary:-*
>
> *(i) Use of quiet plant and its regular maintenance (control at source).*
>
> *(ii) Control of working practices (including hours of working), insulation, enclosure and cladding of plant.*
>
> *(iii) Siting of plant, access and working areas away from existing or committed noise sensitive uses.*
>
> *(iv) Acoustic screening, by earth mounding, planting or fencing.*
>
> *These measures would be such as to ensure that specified noise levels are not exceeded. The advice in Appendix 3 will be used as a guide to set appropriate levels.*
>
> *Kent's standards reflect those generally adopted nationally, although the position will continue to be reviewed in the light of fresh advice."*

Appendix 3 of the Waste Local Plan states that proposals should be accompanied by information on the prevailing background noise levels together with an assessment of maximum noise levels expected to be generated and their variations during the day. Particular emphasis is placed on early morning working, before 07:00 hours.

Jacobs, the consultants advising Kent County Council's Environmental Health Department, were consulted during the preparation of this assessment.

An email from Jacobs stated:

> *"normally for such a large scale development, incorporating an AD plant, materials recycling facility, waste transfer facility and maturation area etc; we would expect that the applicant demonstrate through PPG24, BS4142, MPS2 etc that noise levels from the development would not give rise to complaints from the surrounding residents; this would include evening, night and weekend working periods. The impact of the vehicles accessing the site would also need to be considered in the assessment."*

The guidance documents used in this assessment are described below.

6.2.2 British Standard 4142

BS4142: 1997: *Method for rating industrial noise affecting mixed residential and industrial areas* is intended to be used to assess whether noise from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises is likely to give rise to complaints from people residing in nearby dwellings. The procedure contained in BS4142 for assessing the likelihood of complaint is to compare the measured or predicted noise level from the source in question, the "specific noise level", immediately outside the dwelling with the background noise level. Where the noise contains a *"distinguishable discreet continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks, clatters or thumps), or if the noise is irregular enough to attract attention"* then a correction of +5dB is added to the specific noise level to obtain the "rating level" or L_{Ar}.

The likelihood of noise provoking complaints is assessed by subtracting the background noise level from the rating noise level. BS4142 states:

> *"A difference of around 10dB or higher indicates that complaints are likely. A difference of around 5dB is of marginal significance. A difference of -10dB is a positive indication that complaints are unlikely."*

This assessment is carried out over a one hour period for the daytime and a five minute period for the night-time. Day or night are not defined in the standard but it states that night should cover the times when the general adult population are preparing for sleep or are actually sleeping. For the purposes of this assessment, it is assumed that day and night are as described in PPG24; day is 07:00 to 23:00 hours and night-time is 23:00 to 07:00 hours.

6.2.3 Draft Guidelines for Noise Impact Assessment

The draft *Guidelines for Noise Impact Assessment* produced by the Institute of Acoustics/Institute of Environmental Management and Assessment Working Party have been referenced in relation to the potential changes in ambient noise level during the operational use of the development.

The findings of the Working Party are draft at present although they are of some assistance in this exercise. The draft guidelines state that for any assessment, the noise level threshold and significance statements should be determined by the assessor, based upon the specific evidence and likely subjective response to the noise

The impact scale adopted in this assessment is shown below.

Table 3-1
Impact Scale for Comparison of Future Noise against Existing Noise

Change in Noise Level dB(A)	Subjective Response	Significance
0	No change	Negligible/Neutral
0.1-2.9	Barely perceptible	Slight Impact
3.0-9.9	From a noticeable change to a doubling or halving in loudness	Moderate impact
10.0 or more	More than a doubling or halving in loudness	Large impact

The criteria above reflect key benchmarks that relate to human perception of sound. A change of 3dB(A) is generally considered to be the smallest change in noise that is perceptible. A 10dB(A) change in noise represents a doubling or halving of the noise level.

It is considered that the criteria specified in the above table provide a good indication as to the likely significance of changes in noise levels in this case. Therefore, the noise threshold levels and significance statements above have been used to supplement the assessment of operational noise sources.

6.3 ENVIRONMENTAL NOISE SURVEY

Baseline noise surveys were carried out on 10th and 11th October and 25th November 2007 to establish the existing noise climate at four of the nearest noise-sensitive receptors to the site during weekday and weekend periods. The survey methodology and results are set out below.

6.3.1 Survey Methodology

The noise monitoring equipment used during the surveys is detailed in Appendix B. The sound level meter was calibrated before and after measurements and no calibration drifts were found to have occurred. The equipment had been calibrated by the manufacturer within the 24 months preceding the surveys.

Noise measurements were undertaken at the following positions which were considered representative of the residential noise-sensitive receptors closest to the site:

- Position 1 on land to the south of Upper Otterpool, to the south of the site;
- Position 2 Otterpool Manor, to the west of the site;
- Position 3 Barrow Hill Farm Cottages, to the north-west of the site; and
- Position 4 Mink Farm to the north-east of the site.

The measurement positions are shown in Appendix C.

Measurements of non-consecutive 15 minute periods were undertaken during the weekday survey to total a measurement of one hour at each location during the daytime periods and half an hour at each location during the night-time periods.

During the weekend survey, noise levels were measured in non-consecutive 15 minute periods to total 1½ hours during the daytime period (07:00 to 23:00 hours) and 30 minutes at night (23:00 to 07:00 hours).

At each position the microphone was at a height of 1.2 to 1.5 metres above the ground and in a free-field location.

6.3.2 Survey Results

The weather during the surveys was suitable for noise measurement, it being dry with low wind speeds.

The full survey results are presented in Appendix D and are summarised in Tables 4-1 and 4-2 below.

Table 4-1
Summary of Measured Weekday Noise Levels, Free-field, dB

Position	Period	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
Upper Otterpool	Daytime	45.7	42.5	47.5	52.0 to 66.5
	Night-time	42.4	37.8	44.8	52.3 to 52.5
Otterpool Manor	Daytime	59.4	47.0	63.5	75.5 to 78.9
	Night-time	56.6	40.9	47.6	73.2 to 85.9
Barrow Hill Farm Cottages	Daytime	67.4	50.3	70.4	79.4 to 93.1
	Night-time	54.2	43.0	50.6	74.9 to 80.1
Mink Farm	Daytime	71.8	50.1	76.8	82.8 to 87.7
	Night-time	63.5	44.0	51.5	88.5 to 89.3

Table 4-2
Summary of Measured Weekend Noise Levels, Free-field, dB

Position	Period	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
Upper Otterpool	Daytime	55.4	42.8	60.9	61.9 to 68.0
	Night-time	53.6	40.1	52.9	66.7 to 67.0
Otterpool Manor	Daytime	66.2	44.7	62.5	83.8 to 87.3
	Night-time	54.8	35.2	42.1	81.1 to 82.4
Barrow Hill Farm Cottages	Daytime	71.5	48.9	72.3	86.8 to 95.0
	Night-time	56.4	35.2	48.0	79.7 to 88.0
Mink Farm	Daytime	73.3	51.6	75.0	87.0 to 94.4
	Night-time	65.1	39.7	54.9	85.5 to 93.5

At all positions the noise climate consisted of local and distant road traffic, aircraft, noise from local residents and natural noise sources such as farm animals and trees rustling in the wind.

6.4 ASSESSMENT OF NOISE LEVELS

The operational noise sources that have been considered are:

- the AD plant;
- the MRF;
- the finished product building; and
- noise from vehicles accessing the site.

The proposed layout is shown on drawing OP/4.

There is no guidance document that can be used for the assessment of all of the noise sources listed above. The impact of the proposed development has therefore been assessed in terms of the impact to the ambient noise levels in the area. In addition, the AD plant has been assessed in accordance with BS4142.

It is noted that Jacobs has requested an assessment in accordance with MPS2. MPS2 is not considered relevant for the assessment of the above noise sources and has therefore not been considered further.

Source noise levels have been referenced from similar but unrelated sites and are shown in Table 5-1 below.

Table 5-1
Source Noise Levels, Free-field dB

Item	L_{Aeq} at 10 metres
AD Plant	56.0
Loading Shovel	80.0

It has been assumed that one loading shovel will work in the MRF and one in the finished product building. For the purpose of the assessment, it has been assumed that the attenuation provided by the building fabric will be 30dB for each building. The assessment has presumed that the doors to the MRF will be fast action electronic doors.

It has been assumed that the electronic doors will stay open for approximately ten seconds per vehicle and that they will also take five seconds to open and five seconds to close.

The Transport Assessment produced by SLR Consulting states that six vehicles per hour will access the MRF and 2 vehicles per hour will access the AD plant.

The predictions have been undertaken using the proprietary noise modelling software, CADNA/A which implements the full range of UK calculation methods. In this instance, noise levels have been calculated using the prediction framework set out in ISO9613 *Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation*.

Table 5-2 shows the noise levels at the noise-sensitive receptors for each of the activities considered.

Table 5-2
Predicted Noise Levels, Free-field dB $L_{Aeq,1\ hour}$

Position	AD Plant	MRF	Finished Product	Vehicle Noise	Total
Upper Otterpool	19.9	45.2	42.1	21.2	47.0
Otterpool Manor	19.9	51.0	37.3	19.0	51.2
Barrow Hill Farm Cottages	16.5	48.5	43.8	24.5	49.8
Mink Farm	15.6	39.5	44.9	16.5	46.0

6.4.1 BS4142 Assessment

The BS4142 assessments of noise from the AD plant are shown in Tables 5-3 and 5-4 below for the weekday and weekend periods.

In accordance with BS4142, a +5dB correction has been added to the noise levels from the AD plant to derive a rating noise level. The background noise level is then subtracted from the rating noise level to obtain an assessment in accordance with BS4142.

Table 5-3
Weekday BS4142 Assessment, Free-field, dB

Location	Period	Background Noise Level L_{A90}	Predicted Rating Noise Level $L_{Ar,T}$	Difference
Upper Otterpool	Daytime	42.5	24.9	-17.6
	Night-time	37.8		-12.9
Otterpool Manor	Daytime	47.0	24.9	-22.1
	Night-time	40.9		-16.0
Barrow Hill Farm Cottages	Daytime	50.3	21.5	-28.8
	Night-time	43.0		-21.5
Mink Farm	Daytime	50.1	20.6	-29.5
	Night-time	44.0		-23.4

Table 5-4
Weekend BS4142 Assessment, Free-field, dB

Location	Period	Background Noise Level L_{A90}	Predicted Rating Noise Level $L_{Ar,T}$	Difference
Upper Otterpool	Daytime	42.8	24.9	-17.9
	Night-time	40.1		-15.2
Otterpool Manor	Daytime	44.7	24.9	-19.8
	Night-time	35.2		-10.3
Barrow Hill Farm Cottages	Daytime	48.9	21.5	-27.4
	Night-time	35.2		-13.7
Mink Farm	Daytime	51.6	20.6	-31.0
	Night-time	39.7		-19.1

BS4142 states:

"A difference of around 10dB or higher indicates that complaints are likely. A difference of around 5dB is of marginal significance. A difference of -10dB is a positive indication that complaints are unlikely."

It can be seen from Tables 5-3 and 5-4 that the operation of the AD plant will lead to a situation where complaints are unlikely.

6.4.2 Ambient Noise Assessment

The effect that the proposals will have on the ambient noise levels in the area can be assessed by logarithmically adding the predicted noise levels to the measured L_{Aeq} noise levels. The results of the assessment have been compared to the impact scale adopted for this assessment, as detailed in Section 3 of this report. Tables 5-5 and 5-6 below show the ambient noise assessments.

Table 5-5
Predicted Ambient Noise Levels during Weekday Operation, Free-field, dB $L_{Aeq,1\ hour}$

Position	Period	Ambient Noise Level		Change	Impact
		Existing	**Predicted**		
Upper Otterpool	Daytime	45.7	49.4	+3.7	Moderate
	Night-time	42.4	42.4	0	Negligible
Otterpool Manor	Daytime	59.4	60.0	+0.6	Slight
	Night-time	56.6	56.6	0	Negligible
Barrow Hill Farm Cottages	Daytime	67.4	67.5	+0.1	Slight
	Night-time	54.2	54.2	0	Negligible
Mink Farm	Daytime	71.8	71.8	0	Negligible
	Night-time	63.5	63.5	0	Negligible

Table 5-6
Predicted Ambient Noise Levels during Weekend Operation, Free-field, dB $L_{Aeq,1\ hour}$

Position	Period	Ambient Noise Level		Change	Impact
		Existing	**Predicted**		
Upper Otterpool	Daytime	55.4	56.0	+0.6	Slight
	Night-time	53.6	53.6	0	Negligible
Otterpool Manor	Daytime	66.2	66.3	+0.1	Slight
	Night-time	54.8	54.8	0	Negligible
Barrow Hill Farm Cottages	Daytime	71.5	71.5	0	Negligible
	Night-time	56.4	56.4	0	Negligible
Mink Farm	Daytime	73.3	73.3	0	Negligible
	Night-time	65.1	65.1	0	Negligible

It can be seen from the Table 5-5 above that the predicted changes in ambient noise levels during the weekday would lead to a negligible impact at all receptors with the exception of Otterpool Manor and Barrow Hill Farm Cottages during the daytime when a slight and barely perceptible impact is predicted and during the daytime at Upper Otterpoole where a moderate impact is predicted.

It can be seen from Table 5-6 that the predicted changes in ambient noise levels during the weekend operation would lead to a negligible impact at all receptors considered with the

exception of Upper Otterpool and Otterpool Manor during the daytime when a slight and barely perceptible impact is predicted.

Mitigation measures to reduce the daytime noise level at Upper Otterpool are considered below.

6.5 MITIGATION MEASURES

The assessment of ambient noise levels has shown that a moderate impact is predicted at Upper Otterpool during the weekday daytime period.

It is recommended that, in order to reduce this impact to slight and barely, the MRF building should be designed to achieve attenuation of 35dB.

6.6 CONCLUSION

Countrystyle Recycling Limited has appointed SLR Consulting Limited to undertake a noise assessment for a proposed development at Otterpoole Quarry in Sellindge, Kent.

A BS4142 assessment of noise from the fixed plant has shown that the weekday and weekend operations will lead to a situation of complaints unlikely.

The ambient noise assessment has shown that, with the recommended mitigation measures, the impact on ambient noise levels will be at worst, slight and barely perceptible.

6.7 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Countrystyle Recycling Facilities; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work

Appendix A - Glossary of Terminology

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A-1
Sound Levels Commonly Found in the Environment

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

Acoustic Terminology

dB (decibel) The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure ($2x10^{-5}$Pa).

dB(A) A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies. Commonly termed dB(A) or with an "A" in the noise level descriptor, such as $L_{Aeq, T}$.

Linear A linear or unweighted noise level, commonly termed dB(Lin) or with an "L" in the noise descriptor, such as $L_{Leq, T}$, has no weighting, such as the A-weighting, applied.

L_{Aeq} L_{Aeq} is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

L_{10} & L_{90} If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is

often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.

L_{Amax} — L_{Amax} is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.

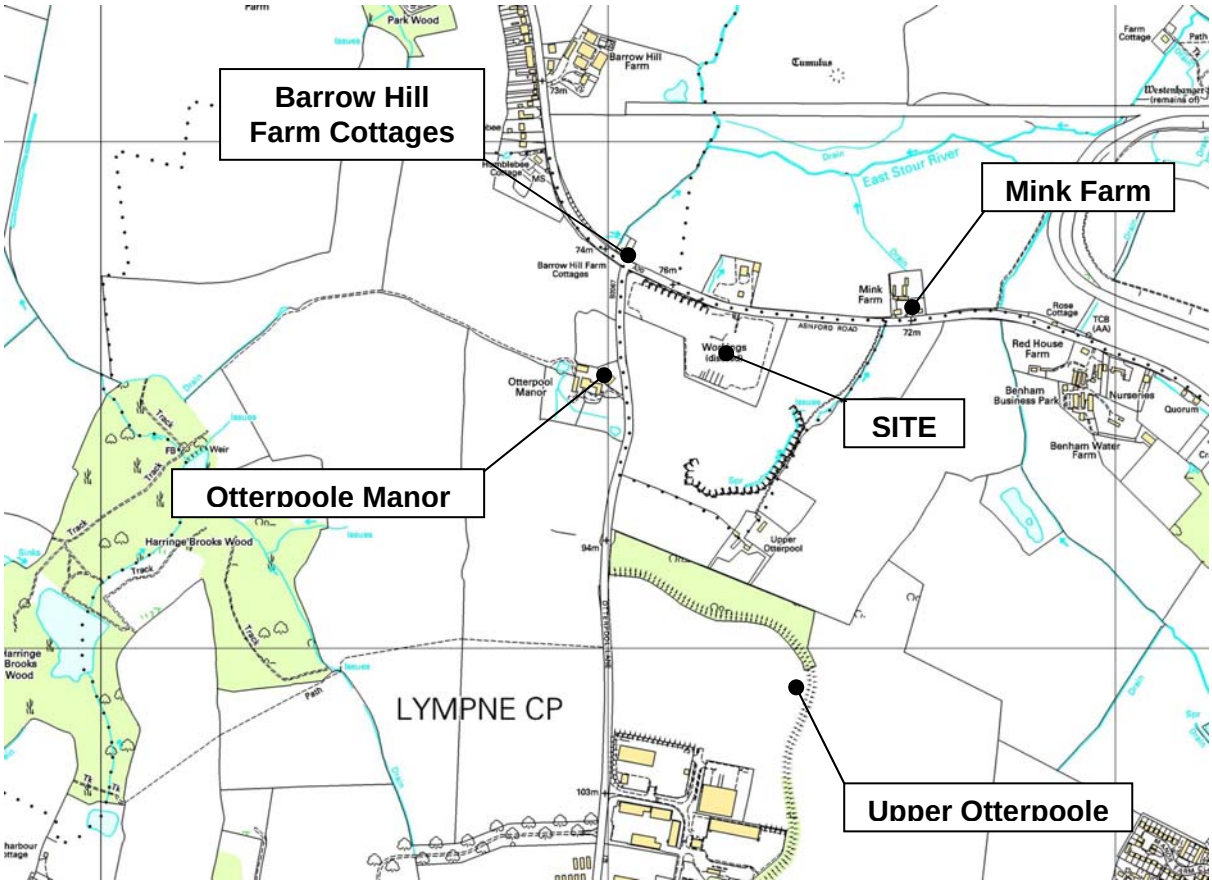
Appendix B – Noise Monitoring Equipment

Table B-1
Noise Monitoring Equipment

Location	Equipment	Serial number
All Locations	01dB SOLO type 1 sound level meter	11801
	01dB PRE12N pre-amplifier	12475
	01dB MCE212 microphone	67428
	01dB CAL21 acoustic calibrator	35242422

Appendix C – Noise Monitoring Locations

Figure C1 – Noise Monitoring Locations



Appendix D – Full Survey Results

Table D-1
Weekday Measured Noise Levels, Position 1 – Upper Otterpoole, Free-field, dB

Date	Time	Duration (hh:mm)	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
10/10/2007	12:06	15:00	46.2	41.6	49.2	66.5
	13:31	15:00	46.3	44.3	47.5	56.4
	14:52	15:00	46.4	43.7	48.2	58.8
11/10/2007	00:44	15:00	42.8	36.6	45.7	52.3
	02:07	15:00	41.9	39.0	43.8	52.5
	10:10	15:00	43.0	40.2	45.1	52.0

Table D-2
Weekday Measured Noise Levels, Position 2 – Otterpoole Manor, Free-field, dB

Date	Time	Duration (hh:mm)	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
10/10/2007	12:34	15:00	60.2	48.6	63.7	78.2
	13:52	15:00	58.8	47.7	63.4	75.9
	15:32	15:00	59.7	50.8	63.9	75.5
11/10/2007	01:06	15:00	51.5	43.9	48.7	73.2
	02:29	15:00	58.9	37.9	46.5	85.9
	10:31	15:00	58.9	40.8	62.9	78.9

Table D-3
Weekday Measured Noise Levels, Position 3 – Barrow Hill Farm Cottages, Free-field, dB

Date	Time	Duration (hh:mm)	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
10/10/2007	12:52	15:00	65.4	50.1	70.2	82.5
	14:12	15:00	70.3	50.6	71.1	93.1
	15:12	15:00	66.1	52.4	70.7	79.4
11/10/2007	01:25	15:00	53.6	43.0	48.7	74.9
	02:46	15:00	54.7	42.9	52.4	80.1
	10:49	15:00	65.7	48.0	69.7	84.0

Table D-4
Weekday Measured Noise Levels, Position 4 – Mink Farm, Free-field, dB

Date	Time	Duration (hh:mm)	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
10/10/2007	13:11	15:00	69.2	49.9	74.4	82.8
	14:31	15:00	71.4	51.3	76.8	85.6
	15:51	15:00	73.8	53.8	78.8	87.7
11/10/2007	01:44	15:00	62.4	41.8	49.0	89.3
	03:05	15:00	64.4	46.1	54.0	88.5
	11:07	15:00	71.6	45.5	77.1	87.7

Table D-5
Weekend Measured Noise Levels, Position 1 – Upper Otterpoole, Free-field, dB

Date	Time	Duration (hh:mm)	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
25/11/2007	00:45	00:15	55.7	40.8	60.9	67.0
	02:04	00:15	49.4	39.4	44.9	66.7
	11:30	00:15	55.4	42.9	60.8	64.1
	12:45	00:15	55.1	42.1	60.7	65.8
	14:15	00:15	55.1	42.8	60.6	61.9
	15:29	00:15	56.0	43.2	60.9	64.0
	19.26	00:15	54.7	41.6	60.5	68.0
	20.49	00:15	56.2	44.1	61.6	62.7

Table D-6
Weekend Measured Noise Levels, Position 2 – Otterpoole Manor, Free-field, dB

Date	Time	Duration (hh:mm)	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
25/11/2007	01:05	00:15	56.4	36.4	43.0	81.1
	02:24	00:15	52.2	33.9	41.2	82.4
	11:50	00:15	68.7	45.6	70.9	87.3
	13.02	00:15	68.2	47.4	68.8	87.0
	14.34	00:15	67.6	45.2	68.3	86.5
	15.47	00:15	64.3	44.5	63.1	83.8
	19.46	00:15	60.6	41.9	52.9	83.8
	21.08	00:15	61.0	43.3	51.0	84.0

Table D-7
Weekend Measured Noise Levels, Position 3 – Barrow Hill Farm Cottages, Free-field, dB

Date	Time	Duration (hh:mm)	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
25/11/2007	01:23	00:15	53.7	36.7	49.4	79.7
	02:24	00:15	58.0	33.7	46.5	88.0
	12.06	00:15	74.4	51.2	78.5	91.4
	13.21	00:15	71.6	48.1	75.3	91.7
	14.51	00:15	72.9	50.6	76.9	95.0
	16.05	00:15	71.3	52.1	75.3	86.8
	20.05	00:15	68.8	45.5	66.4	91.2
	21.27	00:15	64.3	46.1	61.4	87.7

Table D-8
Weekend Measured Noise Levels, Position 4 – Mink Farm, Free-field, dB

Date	Time	Duration (hh:mm)	$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{AFMax}
25/11/2007	00:24	00:15	66.9	41.0	57.8	93.5
	01:44	00:15	62.1	38.3	51.9	85.5
	11:10	00:15	75.4	53.2	80.4	92.6
	12.23	00:15	75.8	52.6	80.9	90.6
	13.55	00:15	74.7	53.8	79.5	90.2
	15:10	00:15	71.7	52.5	75.7	94.4
	19:10	00:15	67.9	49.2	67.3	87.0
	20.22	00:15	67.6	48.0	66.3	87.2

Appendix E – Indicative Site Layout

See Drawing OP/4

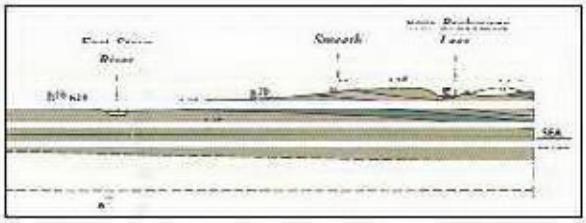
Appendix F – Limitations to this Report

This entails a physical investigation of the site with a sufficient number of sample measurements to provide quantitative information concerning the type and degree of noise affecting the site. The objectives of the investigation have been limited to establishing sources of noise material to carrying out an appropriate assessment.

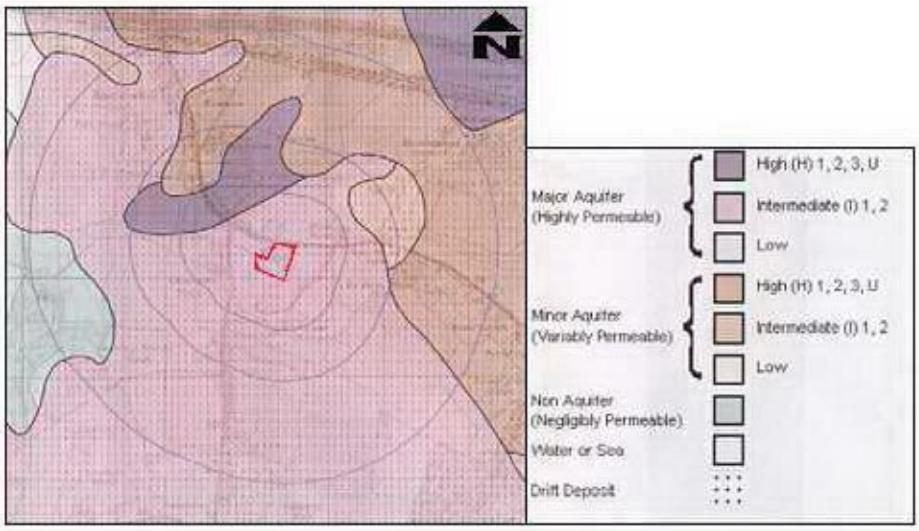
The number and duration of noise measurements have been chosen to give reasonably representative information on the environment within the agreed time, and the locations of measurements have been restricted to the areas unoccupied by building(s) that are easily accessible without undue risk to our staff.

As with any sampling, the number of sampling points and the methods of sampling and testing cannot preclude the existence of “hotspots” where noise levels may be significantly higher than those actually measured due to previously unknown or unrecognised noise emitters. Furthermore, noise sources may be intermittent or fluctuate in intensity and consequently may not be present or may not be present in full intensity for some or all of the survey duration.

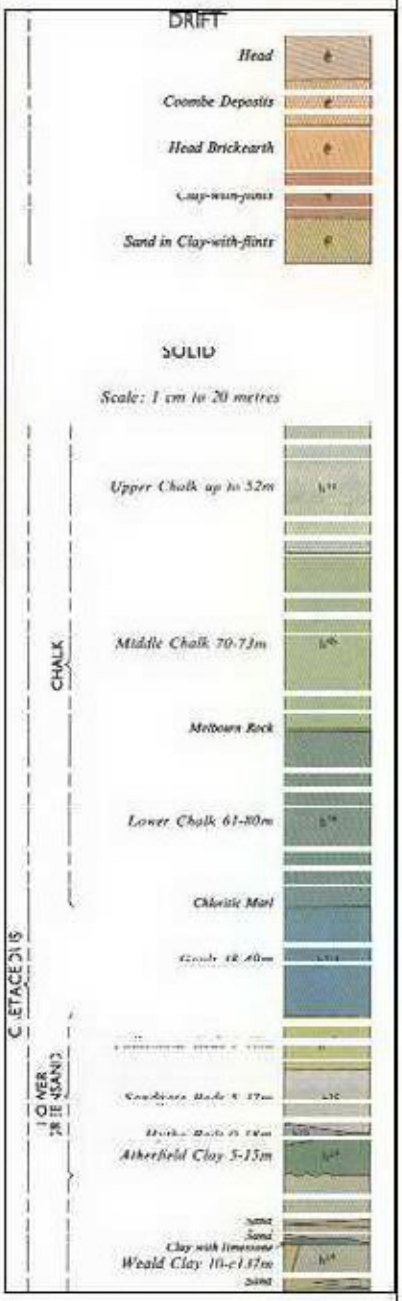
EXTRACT FROM GEOLOGICAL MAP



HORIZONTAL CROSS SECTION



EXTRACT FROM GROUNDWATER VULNERABILITY MAP



GENERALIZED VERTICAL SECTION

NOTES

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Revision	Issue Date	Issued By	Comments
0	OCT 2007	PB	

COUNTRYstyle RECYCLING
WASTE MANAGEMENT SOLUTIONS

Site	OTTERPOOL QUARRY
Project	ENVIRONMENTAL STATEMENT
Drawing	Regional Geology And Groundwater Vulnerability
Date	OCTOBER 2007
Drawing No.	1
Scale	AS SHOWN

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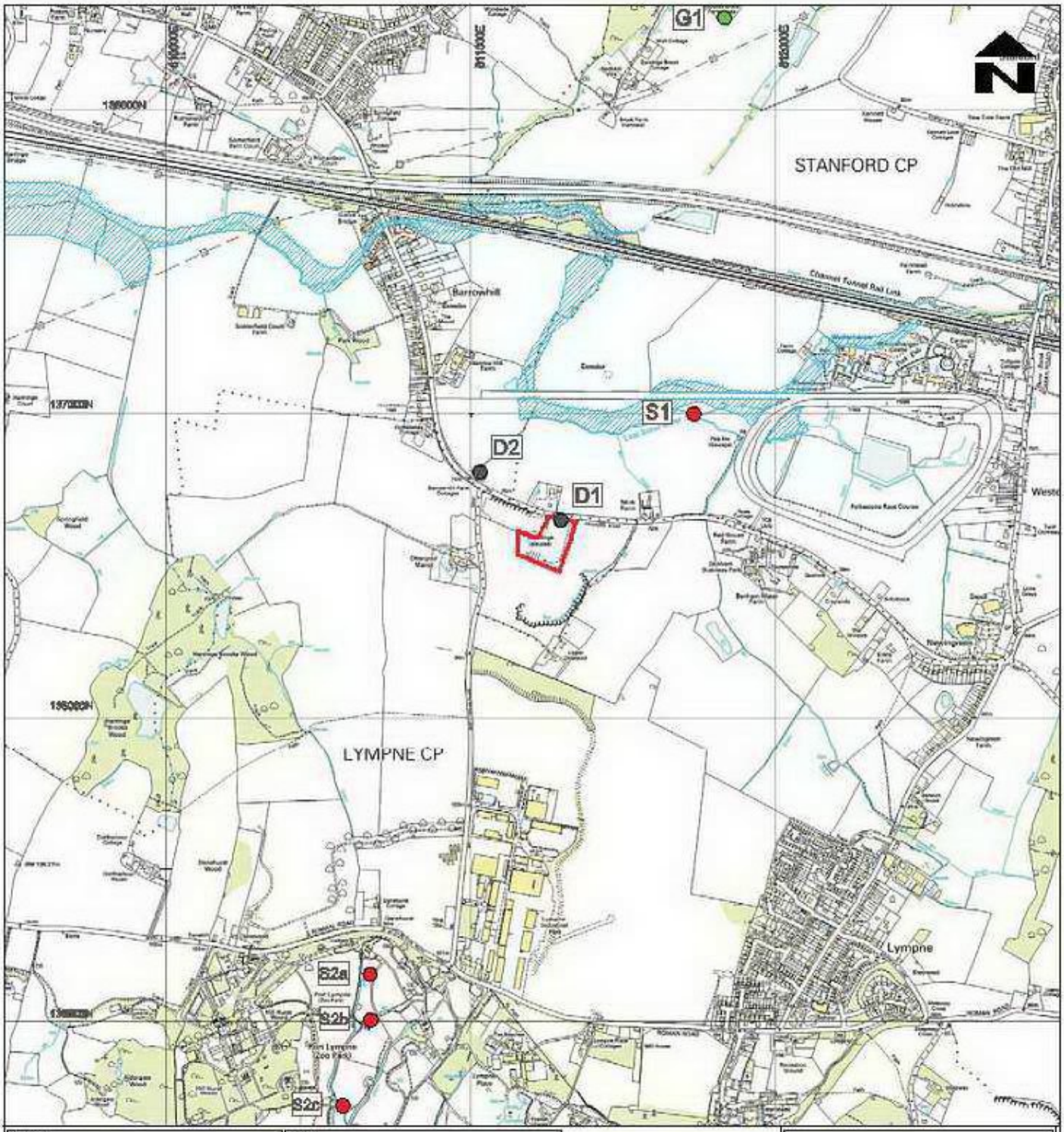

NOTES

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KEY

- PLANNING PERMISSION BOUNDARY
- UNLICENSED GROUNDWATER ABSTRACTION POINT (REFERENCED IN TABLE ES6(M1))
- LICENSED SURFACE ABSTRACTION POINT (REFERENCED IN TABLE ES(D1.7))
- CONSENTED DISCHARGE POINT (REFERENCED IN TABLE ES(D1.9))
- FLOOD ZONE 2

COUNTRYstyle RECYCLING

WASTE MANAGEMENT SOLUTIONS

Site: OTTERPOOL QUARRY

Project: ENVIRONMENTAL STATEMENT

Drawing: **Regional Hydrology And Hydrogeology**

Date: NOVEMBER 2007 | Drawing No.: 2

Scale: 1:12500

Revision	Issue Date	Issue By	Comments
0	NOV 2007	PB	

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Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 7 – Hydrology and Flood Risk Assessment

SLR Ref 409.1376.00002

December 2007

CONTENTS

TABLES

DRAWINGS

7.0 INTRODUCTION

This chapter details the local hydrology and hydrogeology of the application site and surrounding area and identifies potential geological, hydrogeological and hydrological impacts associated with the proposed development.

Unmitigated impacts are considered for the initial assessment assuming that no mitigation is in place, before discussing appropriate mitigation measures and reassessing potential impacts. The assessment is based on a detailed baseline description of the local geological, hydrological and hydrogeological regimes. A flood risk assessment and surface water management scheme is also presented.

7.1.1 *Policy Context*

The development of the proposed site would be undertaken using technical guidance, relevant Pollution Prevention Guidelines and other codes of best practice in order to limit the potential for contamination of ground and surface waters, the potential for flooding to be caused by the development, and other potential impacts. The development of the site would be in accordance with the following:

- Control of Pollution Act 1974;
- Environment Act 1995;
- the Environment Agency's statutory obligations over the management and control of pollution into water;

- EC Water Framework Directive (2000/60/EC);
- Control of Water Pollution from Construction Sites – Guide to Good Practice (CIRIA 2002);

- Control of Pollution from Construction Sites C532 (CIRIA 2001);
- Code of Practice for Site Investigations, BS5930;
- Environmental Good Practice on Site C650 (CIRIA 2005);
- CIRIA Report C609 Sustainable Drainage Systems – Hydraulic, Structural and Water Quality Advice, 2004;

- Sustainable Urban Drainage Systems – Best Practice Manual. CIRIA Report C523, 2001;

- Sustainable Urban Drainage Systems – Design Manual for England and Wales. CIRIA Report C522, 2000; and

- Planning Policy Statement 25: Development and Flood Risk, Published by Department for Communities and Local Government, December 2006.

The Pollution Prevention Guidelines identified below are the principal documents used for guidance on preventing water pollution and erosion from construction activities and are jointly produced by the Environment Agency for England and Wales, Scottish Environment Protection Agency and the Environment and Heritage Service in Northern Ireland and are available via the EA's website (www.environment-agency.gov.uk):

- PPG1: General Guide to the Prevention of Pollution;

- PPG2: Above Ground Oil Storage Tanks;
- PPG3: Use and Design of Oil Separators in Surface Water Drainage Systems;
- PPG4: Disposal of Sewage where no Mains Drainage is Available;
- PPG5: Works in, Near, or Liable to Affect Watercourses;
- PPG6: Working at Construction and Demolition Sites;
- PPG8: Storage and Disposal of Used Oils;
- PPG18: Managing Firewater and Major Spillages;
- PPG21: Pollution Incident Response Planning;
- PPG22: Dealing with Spillages on Highways; and
- PPG23: Maintenance of Structures over Water.

7.1.2 *Methodology*

The methodology applied in the assessment is a qualitative risk assessment methodology, in which the probability of an impact occurring and the magnitude of the impact, if it were to occur, are considered. This approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the development. This approach allows effort to be focused on reducing risk where the greatest benefit may result. The assessment of risk is outlined in Table 1-1.

Table 1-1
Matrix used to Estimate Risk

Probability of Occurrence	**Magnitude of Potential Impacts**			
	Severe	Moderate	Mild	Negligible
High	High	High	Medium	Low
Medium	High	Medium	Low	Near Zero
Low	Medium	Low	Low	Near Zero
Negligible	Low	Near Zero	Near Zero	Near Zero

The definition of degrees of magnitude of potential impacts in terms of geology, hydrogeology and hydrology are detailed in Table 1-2 overleaf.

Table 1-2
Magnitude of Potential Geological, Hydrological and Hydrogeological Impacts

Magnitude	Potential Impact
Negligible	No impact or alteration to existing important geological environs or important soil settings (i.e. valuable agricultural land) No alteration or very minor changes with no impact to watercourses, hydrology, hydrodynamics, erosion and sedimentation patterns; No alteration to groundwater recharge or flow mechanisms; and No pollution or change in water chemistry to either groundwater or surface water.
Mild	Some loss of important soils or peat, but which has no long term impact Minor or slight changes to the watercourse, hydrology or hydrodynamics; Changes to site resulting in slight increase in runoff well within the drainage system capacity; Minor changes to erosion and sedimentation patterns; and Minor changes to the water chemistry.
Moderate	Slope failure or instability which may cause foundation problems, loss of extensive areas of important soils or peat, damage to important geological structures/features Some fundamental changes to the watercourse, hydrology or hydrodynamics; Changes to site resulting in an increase in runoff within system capacity; Moderate changes to erosion and sedimentation patterns; and Moderate changes to the water chemistry of surface runoff and groundwater.
Severe	Slope failure or instability which results in loss of life, permanent degradation and total loss of peat bog environment across the entire development site, loss of important geological structure/feature. Wholesale changes to watercourse channel, route, hydrology or hydrodynamics; Changes to site resulting in an increase in runoff with flood potential and also significant changes to erosion and sedimentation patterns; and Major changes to the water chemistry or hydro-ecology.

7.1.3 *Sources of Information*

The following sources of information have been consulted in order to investigate the hydrogeology and hydrology of the area surrounding the application site:

- British Geological Survey Sheet 1:50,000 scale, Sheets No. 305 and 306 (Solid and Drift Edition) – Folkestone;
- Environment Agency Groundwater Vulnerability Map 1:100,000 scale, Sheet 47, Kent;
- Hydrogeological Map of the Chalk and Lower Greensand of Kent, Institute of Geological Sciences;
- Environment Agency Website (www.environment-agency.gov.uk) for details of river quality, source protection zones and flooding;
- Centre for Ecology and Hydrology and British Geological Survey Wallingford Hydrometric Register and Statistics 1996-2000;
- Centre of Ecology and Hydrology (CEH Wallingford), Flood Estimation Handbook CD ROM (2006);
- Ministry of Agriculture, Fisheries and Food (MAFF) Technical Bulletin 34 Climate and Drainage (1975);

- Shepway District Council Environmental Health Department for details of private water abstractions;

- Screening and scoping opinion in correspondence from the Environment Agency to Kent County Council (dated 25/10/2007);

- Environment Agency responses (dated 30/10/2007 and 13/11/2007) to Information Requests, giving information regarding flood zones, requirements for Flood Risk Assessment and attenuation, Source Protection Zones, water abstractions, groundwater levels and Discharge Consents;

- Policy and Protection for the Protection of Groundwater: Regional Appendix – Southern Region, National Rivers Authority (1992); and

- The Physical Properties of Major Aquifers in England and Wales, BGS Technical Report WD/00/04, Environment Agency R & D Publication 68, 2000.

7.1 REGIONAL GEOLOGY

An extract of the regional geological map is presented as Drawing No. 1. The published geological map (Combined Sheets 305 and 306 Folkestone, British Geological Survey, Solid and Drift) indicates that the proposed development is underlain by the Hythe Formation, part of the Lower Greensand Group.

The Hythe Formation consists of alternating beds up to 0.6m thick of grey sandy limestone and grey loosely cemented sandstone, known respectively as “Rag” and “Hassock”. The total thickness of the Hythe Formation is shown on the Hydrogeological Map as approximately 10m at the site. However, as the historical quarrying at the site excavated approximately 3-5m thickness of sands, the effective remaining thickness is approximately 5-7m.

The Hythe Beds are underlain by 5 – 15m thickness of Atherfield Clay, which is in turn underlain by the Wealden Clay deposits. The Atherfield Clay consists of multi-coloured clays, in parts sandy and with ironstone layers.

The BGS Geoindex website (www.bgs.ac.uk/geoindex) shows that there are no active mines or quarries within the vicinity of the application site. However, there is a former quarry, the Otterpool Quarry Geological SSSI adjacent to the site to the south and east. The main feature of this SSSI is an exposed rockface approximately 200m away from the application site boundary.

7.2 HYDROGEOLOGY

7.2.1 Aquifer Characteristics

The Hythe Beds are classified as a Major Aquifer by the Environment Agency, as detailed in Policy and Protection for the Protection of Groundwater: Regional Appendix – Southern Region, and as confirmed by the screening and scoping opinion passed on from the Environment Agency to Kent County Council[1]. A description and hydrogeological classification of the geological units at site is presented in Table 3-1.

The classification of the Hythe Beds as a Major Aquifer is also indicated in the Groundwater Vulnerability Map (Sheet 47, Kent), an extract of which is presented in Drawing No.1. The Groundwater Vulnerability Map also classifies the leaching potential of the soils across the site as being 'Intermediate'. This indicates the soils can possibly transmit a wide range of pollutants because of their moderate ability to attenuate diffuse source pollutants, and the fact that some non-adsorbed diffuse source pollutants and liquid discharges could penetrate the soil layer.

The British Geological Survey (Physical Properties of Major Aquifers in England and Wales, 2000) report that the Hythe Formation in Kent is rarely used as a groundwater resource on its own, but in combination with the overlying Folkestone Formation (which is absent at the application site). However, BGS reports that the hydraulic conductivity of the Hythe Formation has been modelled by Mid Kent Water plc as 10-20 m /day, which indicates a significant water resource. Groundwater flow is primarily through fractures within the calcareously cemented "rag" sandy limestone beds.

Table 3-1
Hydrogeological Characteristics of Geological Units in Vicinity of Application Site

Period	Geological Unit	Characteristics (after PPPG Regional Appendix – Southern Region)	Hydrogeological Classification
Lower Cretaceous	Hythe Formation	Limited significance for water supply in Kent because formation disappears only a short way north of the outcrop.	Major Aquifer
	Atherfield Clay	Of no significance	Non-aquifer
	Wealden Clay	Of no importance as an aquifer. Local well supplies tap the sandstone and limestone bands, but yields are very small and often cannot be sustained.	Minor Aquifer

It is noted that there are few surface water bodies on the outcrop of the Hythe Formation, indicating that this unit is likely to have a high permeability and allows the rapid infiltration of incident rainfall.

[1] Letter dated 25.10.07 from Jennifer Wilson, Technical Specialist of the EA, to Angela Watts of Kent County Council

7.2.2 Recharge Mechanisms

The Institute of Hydrology FEH CD ROM 2006 reports that the average annual rainfall at the site was recorded as being 795mm between 1941 and 1970. The proposed development area lies within MAFF Agroclimate[2] region 39E which indicates that the average annual rainfall is 683mm. The average potential evapotranspiration reported by MAFF is 563mm per annum. The Environment Agency has no rainfall gauges within 2km of the site.

Given the presence of relatively permeable Hythe Formation beneath the site, it is concluded that the majority of incident rainfall infiltrates directly into the ground. Hence much of the incident rainfall is likely to supply nearby watercourses as baseflow within the Hythe Formation.

7.2.3 Groundwater Levels and Flows

The Environment Agency has no groundwater monitoring boreholes within 2km of the site, and has not been able to provide any specific groundwater level information.

The Hydrogeological Map indicates a fairly steep northwards hydraulic gradient of approximately 0.015 in the Hythe Formation beneath the application site, parallelling the steep topographic gradient from the hilltop to the south. The Hydrogeological Map indicates that groundwater levels in the Hythe Formation in the vicinity of the application site are likely to be approximately 70-80maOD, i.e. within a few metres of the ground surface. The Environment Agency has estimated[3] that the groundwater table is likely to be slightly higher than 65-75 maOD, based on the elevations of the base of the Hythe Beds and the East Stour River. The Environment Agency has confirmed[4] that the unsaturated zone between the ground surface and the water table is likely to be of limited thickness at this site.

The Ordnance Survey Map indicates that in the exposed rockface of Otterpool Quarry SSSI there is a spring 200m south of the site boundary and also 'issues' 80m east of the site boundary. These are likely to be due to the fact that the excavated quarry face intersects the water table in the Hythe Formation. The existence of these springs immediately up hydraulic gradient of the application site, with their outflow feeding a tributary ditch flowing away from the site as detailed in section 4.1 below, is likely to reduce groundwater flow beneath the site.

7.2.4 Source Protection Zones, Groundwater Abstractions, and Groundwater Quality

The Environment Agency has confirmed[3,4] that the proposed development area does not fall within a Source Protection Zone, and that the nearest Source Protection Zone is approximately 1.9km east of the site, relating to the Postling public water supply abstraction. There are no licensed groundwater abstractions with 2km of the site.

The Environment Agency and the Environmental Health Department of Shepway District Council have indicated[3,5] that there are seven private groundwater supplies within a 3km

[2] MAFF, 1976. *Climate and Drainage.* Technical Bulletin 34. HMSO, London.

[3] Letter from EA External Relations Officer Karen Rigg responding to Information Request, 13 November 2007

[4] Screening and Scoping Opinion Letter from Jennifer Wilson (EA Technical Specialist) to Angela Watts of Kent County Council, dated 25 October 2007

[5] Telephone conversation 19 October 2007

radius of the site, and details are presented in Table 3-2 below. The presumed formation from which these supplies draw groundwater (based on the nearest water-bearing formation to surface) is indicated in Table 3-2.

- supplies G1-G3 and G5 are located approximately 1.5km north of the application site, located on an outcrop of the Folkestone Formation, and are likely to draw groundwater from this unit rather than the Hythe Formation, which is deeper at this location and separated from the Folkestone Formation by the low permeability silts and mudstones of the Sandgate Formation. Hence these groundwater abstractions are very unlikely to be affected by the proposed development which is sited on the Hythe Formation;

- supplies G6 and G7 are likely to draw water from the Hythe Formation, but as they are located respectively upgradient and laterally from the application site, they are unlikely to be affected by the proposed development;

- supply G4 is likely to draw water from the Hythe Formation, and is located approximately 1.5km from the application site in a generally downstream direction. However, as groundwater flow at the application site is likely to be approximately to the NNE[6], and G4 lies to the NNW of the site, G4 is unlikely to be affected by the proposed development, especially given the measures to protect local groundwater proposed in section 5.3 below.

No data on the quality of the groundwater within local boreholes is available[3]. However, the Hydrogeological Map indicates that chloride concentrations in this part of the Hythe Formation are in the range 30-50 mg/l, and hardness (expressed as $CaCO_3$) approximately 400 mg/l.

[6] Based on groundwater contours shown on the Hydrogeological Map

Table 3-2
Summary of Water Abstractions within 2km of the Proposed Development

Ref No.	Licence Number	Holder	NGR	Purpose	Annual	Daily	Hourly	Source (formation presumed)
G1	Unlicensed	Gibbons Brook Farm	611750 138300	Domestic	-	-	-	Groundwater (Folkestone Formation)
G2/G3	Unlicensed	-	611600 138200	Domestic	-	-	-	Groundwater (Folkestone Formation)
G4	Unlicensed	-	610480 138340	Domestic	-	-	-	Groundwater (Hythe Formation)
G5	Unlicensed	-	611680 138310	Domestic	-	-	-	Groundwater (Folkestone Formation)
G6	Unlicensed	-	609950 135480	Domestic	-	-	-	Groundwater (Hythe Formation)
G7	Unlicensed	-	612120 136450	Domestic	-	-	-	Groundwater (Hythe Formation)
S1	9/40/04/0027	Lingfield Park 1991 Ltd	611730 137000	Spray Irrigation of Race Course	9,092	455	18.9 m^3	Watercourse at Folkestone Race Course
S2A	15/049A	The Howletts Wild Animal Trust	610670 135160	Animal Watering & General Use (Non Agricultural)	25,000	70	3m^3	Watercourse (Feeder to Royal Military Canal)
S2B	15/049B		610670 135010					
S2C	15/049C		610580 134730					

7.3 HYDROLOGY

7.3.1 Local Hydrology and Surface Water Quality

There are no surface water features within the proposed development area or along its boundaries. The East Stour River flows westwards approximately 300m north of the application site boundary, as shown on Drawing No.2. A tributary ditch flowing into the East Stour River flows northwards approximately 120m east of the site boundary, as shown on Drawing No.2. This tributary ditch is fed by springs which emerge at the rockface in Otterpool Quarry SSSI, approximately 80m east and 200m south of the site boundary, as discussed in section 3.3 above.

There are four licensed surface water abstractions within 2km of the site, as detailed in Table 3-2 above and shown in Drawing No.2. Three of these abstractions draw water from a feeder to the Royal Military Canal located 1.5km south of the site boundary. The other licensed surface water abstraction draws water from the East Stour River 600m north-east of the site, i.e. upstream of the site.

The Environment Agency website (www.environment-agency.co.uk) confirms that the water quality in the East Stour River is generally good, and Envirocheck data indicates few reported pollution incidents. River quality is monitored at Horton Priory Dyke East (NGR 608700 138000) and in 2004-06 the chemical quality was found to be Grade A based on the following parameters:

- biochemical oxygen demand (BOD) averaged 1.45 mg/l;
- ammoniacal nitrogen concentrations averaged 0.025 mg/l; and
- dissolved oxygen averaged 93%.

7.3.2 Surface Water Flows and Discharge Consents

The Environment Agency has confirmed[3] that no surface water tributaries are monitored in the vicinity of the site.

There are two consented discharges within 1km of the site, both of which discharge into the East Stour River. These are summarised in Table 4-1 below and are shown on Drawing No.2. Consented discharge D1 is located at the application site itself, although it is understood not currently to be in use. There is no foulwater drainage within 1km of the application site[7]. There are two further consented discharges approximately 1.5km from the site as shown in Table 4-1, D3 and D4 discharging into land and into a tributary of the East Stour River respectively.

7.3.3 Flooding

The Environment Agency has indicated[8] that the site falls within Flood Zone 1, which represents an annual probability of less than 0.1% of a flood occurring. The location of the nearest Flood Zone 2 (on the East Stour River, 300m to the north of the site) is shown in Drawing No. 2. The Environment Agency has also indicated that their records do not give any indication of flooding from a 'main river' having affected the site in the past.

[7] Telephone conversation with Jim Evans of Southern Water (19.10.07)

[8] Letter from EA External Relations Officer Darren Britton dated 30th October 2007 in response to Information Request

Although the site is only in a Flood Zone 1, owing to the size of the development being greater than 1 hectare, and in accordance with PPS25 – Development and Flood Risk - a flood risk assessment is required and is appended to this section. PPS25 – Development and Flood Risk – states that all uses of land are appropriate in this Zone.

Table 4-2
Consented Discharges

Drawing Ref No.	Consent Number	Site Name	National Grid Reference	Receiving Water	Effluent Description
D1	P02136	Otterpool Quarry	611300 136600	East Stour	Surface Water
D2	P20116	Barrowhill Farm Cottages	611030 136809	Tributary of East Stour	Sewage Discharges – Final/Treated Effluent
D3	P06988	Spicers Estate, Lympne	611150 135110	Into Land	Site Drainage
D4	P21345	Foo Cwaft House, Gibbons Brook	611453 137992	Tributary of East Stour	Sewage Discharges – Final/Treated Effluent

Notes:
Locations shown on Drawing No. 2
Information provided by Environment Agency – consented discharge volumes not provided

7.4 ASSESSMENT OF POTENTIAL IMPACTS

This section identifies the potential impacts of the proposed development on the geological, hydrogeological and hydrological environments. It also assesses the likelihood of occurrence of each identified impact. The results of this assessment are summarised in Table 5-1. It should be noted that the magnitude of the impact has been assessed as described in Table 1-2.

7.4.1 Summary of the Proposed Development

The proposed development is described in detail in the Planning Statement, however, for ease of reference the main features are summarised below:

- construction of office, mess and weighbridge facilities;
- an Anaerobic Digestion Plant (AD) that would be in the form of an enclosed building housing a) waste reception and storage b) horizontal process drums and a maturation pad enclosed by an open-fronted building;
- a Material Recycling Facility (MRF) in the form of an enclosed building designed to manage co-mingled recyclable materials generated by commercial and industrial waste producers, with capacity to deal with possible future waste streams from municipal sources. The MRF would also include an element of waste transfer capacity as it is recognised that some residual waste from both processes would require final disposal to landfill.

7.4.2 Potential Impacts on Geology

The proposed development does not include any change to the landform, and hence no impact on the site geology is involved. The proposed development is not considered likely to have any impact on the adjacent geological SSSI, as the proposed development is at a lower elevation than the SSSI, and is separated by a 2-3m rockface that would not be affected by the development. Hence there is no likelihood of runoff from the proposed development reaching the SSSI and affecting the geology in any way.

7.4.3 Potential Impacts on Groundwater

Given the hydrogeological setting, it is considered that the proposed development has the potential to impact on groundwater in terms of both the groundwater quality and the groundwater flow regime. These are considered separately below.

7.4.4 Groundwater Quality

During the development and operation of the site, there is a risk of groundwater pollution from the following potential sources:

- accidental spillage of fuels and lubricants, required over the short term by construction plant and over the longer term, from operation of the facility and from the lorries moving around the site, including the accidental spillage of potentially contaminative liquids;

- increase in suspended solids and potential for contaminated runoff entering groundwater in the short term during development; and

- the change in land use may result in contaminated runoff from the weighbridges and vehicle movement areas entering groundwater in the long term.

It is considered that without mitigation the probability of occurrence of spillage of fuels, lubricants and other potentially contaminative liquids is 'medium' owing to the area of the site and number of vehicles that would be using the site and the magnitude of impact is 'severe' as groundwater may be within a few metres of the ground surface. Therefore the overall risk without mitigation is 'high'.

It is considered that without mitigation the probability of contaminated runoff entering groundwater during construction of the facility is 'low' to 'medium' owing to the short time frame over which this may occur. The magnitude of impact is 'severe' and therefore the overall risk is 'medium' to 'high'. Without mitigation, it is considered that the probability of occurrence of contaminated runoff from vehicle movement areas entering groundwater in the long term is 'high' and that the magnitude of the potential impact is 'severe' and therefore the overall risk is 'high'.

7.4.5 Groundwater Flow Regime

During the development and operation of the site there is a potential for the groundwater flow regime to be altered by the following activities:

- excavation work for building foundations in the short to long term;
- dewatering in the short term, during construction (if required); and
- the introduction of hardstanding across much of the site in the long term.

Excavation work for building foundations and the permanent installation of foundations may interrupt the groundwater flow regime by creating a barrier to groundwater flow, which may distort the groundwater flow pattern around the site, leading to higher groundwater levels upstream of the site and lower levels downstream of the site. This in turn may affect groundwater abstractions and private water supplies downstream of the site. However, as the unsaturated zone is likely to be several metres thick and the excavations are unlikely to be deeper than 1.5m below ground, it is anticipated that excavations are unlikely to encounter groundwater and that dewatering of excavations would not be required. Therefore, it is considered that the probability of occurrence is 'low' to 'medium', the magnitude of potential impact is 'mild' and the overall estimate of risk is 'low'.

The introduction of hardstanding over the majority of the development site has the potential to affect recharge to the underlying Hythe Formation aquifer and therefore baseflow to the East Stour River. Without mitigation the probability of occurrence is considered to be 'high', the magnitude of potential impact 'negligible' as the site area only represents 0.1% of the outcrop area of Hythe Formation providing baseflow to the East Stour River, and therefore the estimate of risk is 'low'.

7.4.6 Potential Impacts on Surface Water

Given the hydrological setting, it is considered that the proposed development has the potential to impact on the surface water environment in terms of both the surface water quality and the hydraulic regime. These are considered separately below. It should be

noted that the potential impact of the development on flooding is assessed separately in Appendix A.

7.4.7 Surface Water Quality

It is considered that there is negligible risk of surface water pollution directly from the development site from the following potential sources:

- accidental spillage of fuels and lubricants, required over the short term by construction plant and over the longer term, including the accidental spillage of potentially contaminative liquids, from operation of the facility and from lorries moving around the site;
- increase in suspended solids and potential for contaminated runoff in the short term during development; and

- change in land use resulting in contaminated runoff from the weighbridges and vehicle movement areas in the long term.

This assessment reflects the absence of surface water receptors adjacent to the site, together with the following points:

- the nearest surface water course is located over 120m from the site; and
- runoff from the site would enter groundwater in the underlying Hythe Formation prior to entering surface water and therefore mitigation measures to prevent the pollution of groundwater would also protect surface water quality.

7.4.8 Hydrological Regime

The development of the site by the construction of impermeable buildings, weighbridges and covering large areas of the site with hardstanding has the potential to alter the local hydrological regime with the potential effects including:

- increased rate of runoff from the site, which may cause localised flooding; and
- reduced amount of recharge to groundwater which in turn would affect the amount of baseflow to surface watercourses.

Without mitigation it is considered that the probability of occurrence of increasing the rate of runoff from the site is ‘high’, and the magnitude of localised flooding is ‘moderate’ due to the relatively high permeability of the Hythe Formation allowing infiltration around the site, hence the overall impact is considered to be ‘high’. Without mitigation it is considered that the probability of occurrence of decreased baseflow into the East Stour River owing to reduced groundwater recharge at the site is ‘high’, but the magnitude of potential impact is ‘negligible’ as the site area only represents 0.1% of the outcrop area of Hythe Formation providing baseflow to the East Stour River, and therefore the estimate of risk is ‘low’.

It should be noted that the effect of the development on flood risk has been assessed separately in Appendix A. It is noted that the flood risk assessment shows that, with mitigation measures, the development posed no increased residual flood risk.

Table 5-1
Summary of Unmitigated Potential Impacts

Potential Impact	Spatial and Temporal Impact	Probability of Occurrence	Magnitude of Impact	Significance of Impact	Mitigation Required?
Groundwater Quality					
Leakage of fuels etc to groundwater	Local, Short and Long Term	Medium	Severe	High	Yes
Increase in suspended solids in runoff entering groundwater	Local, Short Term	Low to Medium	Severe	Medium to High	Yes
Contaminated runoff entering groundwater	Local, Short and Long Term	High	Severe	High	Yes
Groundwater Flow Regime					
Barrier to groundwater flow	Local/Regional, Long Term	Low	Mild	Low	No
Dewatering and alteration of flow	Local/Regional, Short Term	Low	Mild	Low	No
Reduction in recharge from hardstanding	Local/Regional, Long Term	High	Negligible	Low	No
Hydrological Regime					
Increased rate of runoff leading to flooding	Local, Long Term	High	Moderate	High	Yes, See FRA in Appendix A
Reduction in baseflow to Rivers	Regional, Long Term	High	Negligible	Low	No

7.5 IDENTIFICATION OF APPROPRIATE MITIGATION MEASURES

Table 5-1 has identified a number of potential impacts where mitigation is required to reduce the risk to acceptable levels. Proposed mitigation measures are identified below. These measures either reduce the likelihood of an event occurring, or reduce the magnitude of the consequences if the event does occur. It should be noted that several of the mitigation measures proposed below would have a positive effect on more than one potential impact identified in Table 5-1

7.5.1 Water Quality

In order to mitigate against the risk of pollution to groundwater and surface water occurring during construction, building and operational phases of the development, the following management measures would be included:

- wherever possible a traffic management system would be put in place to reduce the potential conflicts between vehicles, thereby reducing the risk of a collision;
- a site speed limit would be enforced to further reduce the likelihood and significance of collisions;
- all plant would be regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids/liquors;
- refuelling of vehicles would either be undertaken in a surfaced compound area from a fuel tank(s) that is bunded in compliance with the Control of Pollution (Oil Storage) (England) Regulations 2001, and PPG2 or be undertaken off-site to minimise the risk of uncontrolled release of polluting liquids/liquors;
- interceptors would be incorporated into the design of the site to catch any leaks and spills;
- all areas producing potentially contaminated drainage would be sited on impermeable hardstandings to prevent contaminated drainage seeping through to the ground beneath;
- concrete slabs would be joined together in such a manner as not to leave any paths for potential contamination to drain through;
- all hardstandings would be regularly maintained and cracks sealed at the earliest opportunity;
- maintenance of plant and machinery would be undertaken within the site compound or off-site, as appropriate, to minimise the risk of uncontrolled release of polluting liquids;
- spill kits would be made available on-site to stop the migration of spillages, should they occur;
- soil movements and excavations would be undertaken to minimise the generation of silt, and all soils would be stored in accordance with the relevant guidance (such as PPG1, PPG5 and PPG6) to avoid the migration of contaminated liquors. Where necessary, ditches would be cut to capture runoff from areas generating clay and silt laden runoff to allow for settlement of fines (clay and silt fractions) prior to discharge;

- In the unlikely event that water is encountered and is required to be pumped from excavations during construction, it would be directed to a settlement pond prior to discharge or in accordance with CIRIA Report C532;

- water quality samples across the sites (discharge pipes, drainage channels, excavations, silt ponds etc) would be taken and analysed for a range of parameters prior to discharge. If the water is found to be contaminated, disposal actions or tankering off-site would be undertaken in accordance with relevant guidance;

- design of discharges to sealed tank would be in accordance with the relevant Pollution Prevention Guidelines, such as PPG1, PPG4 and PPG5 and all such discharges would be controlled;

- storage of milk and other food stuffs used within the facility would be secured with the filling and removal points bunded to prevent accidental spillage; suitable equipment for preventing the migration of any larger spills would be kept on site; and

- any areas inside the buildings that require washing down or where spillages are likely would be positively drained to sealed tank.

These measures would reduce the probability of leakage to groundwater of fuels, lubricants, waste and food stuffs from 'medium' to 'negligible'. Similarly, these measures would reduce the probability of increase of suspended solids in runoff entering groundwater from 'low to medium' to 'negligible', and contaminated runoff from land use from 'high' to 'low to negligible'. Table 6-1 summarises the mitigation measures applied to each potential impact.

7.5.2 Groundwater Flow Regime

The reduced groundwater recharge resulting in reduced baseflow entering the East Stour River would be mitigated by surface water management draining water from the site into the existing discharge consent which discharges water into the East Stour River.

7.5.3 Hydraulic Regime

The following surface water management measures are proposed, as part of a SuDS scheme for the site to reduce the impact of the development on the hydraulic regime. It should be noted that once the outline scheme has been agreed with the Environment Agency, design details would be finalised and Construction Quality Assurance plan detailing the design would be prepared for Agency approval.

7.5.4 Outline Design

Runoff from the developed area is likely to be greater than runoff prior to development owing to the incorporation of hardstanding across the site. Discussions with the Environment Agency have confirmed that any discharge off site should not exceed an annual probability flood (2 year) and attenuation should be provided for a 1% annual probability plus climate change flood event. Due to the sensitivity of the ground conditions infiltration is not permitted.

In summary, the principle elements of the proposed scheme comprise:

- surface water runoff from all buildings including the AD Plant and MRF and the vehicle parking areas would be positively drained to underground storage and discharged offsite via an oil interceptor in accordance with the current site Discharge Consent. The oil interceptor would remove any potential contamination from the vehicle parks.

7.5.5 Existing Rate of Surface Water Runoff

In order to quantify any potential increase in surface water runoff, the current runoff rate from the pre-developed site must initially be determined. This has been determined using the current 'industry best practice' guidance as outlined in the Interim Code of Practice for SuDS[9]. The recommended methodology for sites up to 50 hectares in area is the Institute of Hydrology Report 124 method (IoH124) and has been calculated using the Micro Drainage WinDes software suite. The following parameters have been incorporated into the runoff calculations:

- Catchment Area: 2.528hectares (measured using AutoCAD from site survey);
- Average Annual Rainfall (SAAR): 795mm/year (from Flood Estimation Handbook CD-ROM);

- Soil Type: 0.3;
- Paved Area: 0% existing, 75% proposed (measured using AutoCAD from site survey and proposed development plan); and

- Region No. 7.

In order to represent the change in runoff at the site as a result of the proposed development, and ascertain the required attenuation to restrict runoff to the present rate, the paved area function within the IoH124 calculation has been increased. The results are presented in Table 6-1. Table 6-1 shows the proposed development of the application site would result in a potential increase in surface water runoff of 18.3l/s during a 1% plus 20% annual probability rainfall event to 38.8l/s. In order to minimise the potential flood risk, it is proposed that the runoff be restricted to the 2-year current rate of runoff (e.g. an equivalent rate of 1.86l/s/Ha) for all events up to and including the 1% plus climate change annual probability flood event.

Table 6-1
Potential Change in the Site Runoff Characteristics

Annual Probability (return period, years)	Pre Development Runoff (l/s)	Post Development Runoff (l/s)	Difference in Runoff (l/s)
50% (2)	4.7	16.3	11.6
20% (5)	6.8	21.6	14.8
10% (10)	8.7	24.4	15.7
5% (20)	10.7	26.8	16.1
2% (50)	14.0	29.5	15.5
1% (100)	17.1	32.4	15.3
1%+climate change (20%)	20.5	38.8	18.3

Note:
1. 20% added to rainfall data to account for long-term climate change in accordance with PPS25

[9] Office of the Deputy Prime Minister, National SuDS Working Group, July 2004, Interim Code of Practice for Sustainable Drainage Systems

2. Runoff calculated for area of 50Ha and scaled to site

7.5.6 Attenuation Feature Designs

The storage requirements to attenuate all surface water runoff from the buildings and vehicle hardstanding during a 1% annual probability flood event plus 20% allowance for climate change have been calculated using the industry standard Micro Drainage WinDes software suite and are presented in Table 6-2.

Table 6-2
Attenuation Design Details

Attenuation Feature	Required Storage Volume (m^3)	Peak Discharge Rate (l/s)
'Clean Water' Attenuation	2250	4.7

7.5.7 Scheme Maintenance

Appropriate, routine maintenance of the proposed surface water management scheme would extend the effective life and overall efficiency of the scheme. In the absence of good site practice and appropriate maintenance, the gradual accumulation of solids within the underground storage tanks would reduce the capacity and effectiveness of the system. It is proposed therefore to incorporate a number of operational practices to ensure that the surface water system performs efficiently. For example, site operatives would routinely monitor the efficiency of the surface water scheme. The accumulation of sediment within the system would be checked and any obstructions (debris etc.) within the system would be removed. When necessary, sediment would be removed and disposed of appropriately.

All aspects of the surface water management system would be constructed in accordance with the Construction Quality Assurance plan agreed with the Environment Agency. Appropriate Environment Agency consents would also be obtained prior to construction of any of the surface water scheme components. The above scheme would reduce the significance of impact of increased rate of runoff from 'high' to 'low to near zero'.

7.6 ASSESSMENT OF RESIDUAL IMPACTS

A summary of the proposed mitigation methods, together with the predicted effects and residual impacts is present in Table 7-1. Examination of Table 7-1 confirms that there are no significant residual impacts with respect to groundwater or surface water provided. Appropriate mitigation measures are undertaken and a surface management scheme is incorporated into the design.

Table 7- 1
Summary of Mitigation and Residual Impacts

Potential Impact	Spatial and Temporal Impact	Probability of Occurrence	Magnitude of Impact	Significance of Impact	Mitigation Required?	Mitigation Measures	Mitigated Probability of Occurrence	Mitigated Magnitude of Impact	Residual Magnitude of Impact
Groundwater Quality									
Leakage of fuels etc to groundwater	Local, Short and Long Term	Medium	Severe	High	Yes	Traffic systems, maintenance, bunding and spill kits	Negligible	Severe	Low
Increase in suspended solids in runoff entering groundwater	Local, Short Term	Low to Medium	Severe	Medium to High	Yes	Minimisation, management and settlement, SuDS	Negligible	Severe	Low
Contaminated runoff entering groundwater	Local, Short and Long Term	High	Severe	High	Yes	SuDS scheme, interceptors, appropriate design	Low to Negligible	Severe	Low
Groundwater Flow Regime									
Alteration of flow	Local, Long Term	Low	Mild	Low	No	N/A	N/A	N/A	N/A
Reduction in recharge from hardstanding	Local/Regional, Long Term	High	Negligible	Low	No	N/A	N/A	N/A	N/A
Hydraulic Regime									
Increased runoff rate causing flooding	Local, Long Term	High	Moderate	High	Yes, See FRA	SuDS scheme and control of discharge	Low to Negligible	Mild to Negligible	Low to Near Zero
Reduction in baseflow to Rivers	Regional, Long Term	High	Negligible	Low	No	N/A	N/A	N/A	N/A

7.7 SUMMARY AND CONCLUSIONS

The groundwater and surface water regimes at the proposed development site have been assessed with reference to information held by the British Geological Survey, the Environment Agency, Local Authorities and others. The development site is located on the Hythe Formation, which is considered to be a Major Aquifer. These deposits overlie the low permeability Atherfield Clay and Wealden Clays.

A single private water supply is located 1.5km of the site; however, this is likely to draw water from the overlying Folkestone Formation rather than the Hythe Formation. The Hydrogeological Map indicates that groundwater flows towards the north from the outcrop area towards the East Stour River.

The site lies within Flood Zone 1 (low risk) and has less than 0.1% annual probability of flooding each year. However, as the development area is greater than 1 Hectare a flood risk assessment has been undertaken which together with the proposed surface water management scheme shows there is no increased or residual flood risk from the proposed development.

The potential impacts of the proposed development upon the hydrogeological and hydrological environments have been identified and assessed, and where appropriate, mitigation measures have been accommodated into the design of the development. It is recommended that all aspects of the construction and operation of the site are in accordance with best practice guidance. Overall, it is concluded that, with respect to geology, groundwater and surface water, there are no significant residual impacts of the development after consideration of the identified mitigation measures.

7.8 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Countrystyle; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

APPENDIX A – FLOOD RISK ASSESSMENT

The Environment Agency's Flood Risk Standing Advice for England (PPS25) (Version 1.0, March 2007: www.pipernetworking.com/floodrisk/index.html) details the requirements of a flood risk assessment for developments in Flood Zones 1, 2 and 3.

With respect to development in Flood Zones 1, the table below details the information required and where it is presented in this flood risk assessment.

Table A-1
Summary of Flood Risk Assessment

A: PLANS	
Location Plan	See Drawing No. 2
Existing Site Contour Plan	See Drawing No. OP/3
Development Proposal Plan	See Drawing No. OP/4
Identification of any Structures which may Influence Local Hydraulics	This is not considered to be applicable as the site has been shown to be in Flood Zone 1.
B: SURVEYS	
Site Levels Related to Ordnance Datum (Existing & Proposed)	Drawing No.OP/3 for current site levels and Drawing No. OP/4 for details of the proposed development.
C: ASSESSMENTS	
Information detailing Current Surface Water Disposal Measures on Site and the State of Maintenance of these Services	Not applicable – the site is currently not developed.
An Assessment of the Volume of Runoff of Surface Water Runoff Likely to be generated by the Proposed Development	See Paragraph 7.55 and Table 6-1
Proposals for SuDS with the Aim of not Increasing, and Where Practicable Reducing the Rate of Runoff from Site as a Result of Development	See Paragraphs 7.57
Estimate of how Climate Change Could Affect the Probability and Intensity of Flood Events	Climate Change has been considered in the site drainage proposals – see Paragraph 7.55
Information About the Potential Sources of Flooding (e.g. rivers, sea, surface water runoff, sewers, groundwater, artificial sources etc.)	The desk study has confirmed that the site lies in Flood Zone 1. The most likely source of flooding to the proposed site, which is remote from any watercourses, is overland water flow.
Information on how Potential Sources of Flooding would be Managed Safely within the Proposed Development	See Paragraphs 7.56-7.57
Consideration of the Proposal Relative to any Existing SFRA	Not applicable – no SFRA has been produced.
Confirmation of whether EA Consent is required for any Aspect of the Work and if this has been Applied for	Not applicable
Consideration of the 'Dry Island' Effect and how this may Affect Access/Exit to the site	Not Applicable

Otterpool Quarry,
Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 8 Ecological Assessment

December 2007

SLR Ref 409.1376.00002

solutions for today's environment

CONTENTS

TABLES

DRAWINGS

8.1 INTRODUCTION

8.1.1 Background

Countrystyle Recycling Limited has retained SLR Consulting Limited (SLR) to undertake an ecological assessment of the Otterpool site near Sellindge, East Kent, which is proposed for the development of an integrated waste management, treatment and recycling facility.

Natural England were consulted on the proposal prior to the Ecological Assessment being undertaken and requested that:

> *'appropriate detailed surveys which should include as a minimum a Phase 1 Habitat survey are included as part of the planning application and that an appropriate mitigation strategy is developed and implemented with regards to protected species should these be present which should include an evaluation of:*
>
> - *the impacts on the protected species concerned;*
> - *the proposed habitat reinstatement post construction if there is to be any loss of natural habitat that should aim to bring about a net gain for biodiversity in line with Planning Policy Statement 9: Biodiversity and Geological Conservation.*
>
> *The surveys should be carried out by experienced and appropriately trained/licensed persons. Information about the potential impacts of the proposal on habitats and protected species and, where necessary, details of mitigation should be submitted before the application is determined.'*

The aim of this report is therefore to satisfy the requirements of Natural England, particularly with respect to protected species, and provide sufficient ecological information in support of the current application in order to inform the planning process.

8.1.2 Application Site Description and Setting

The application site falls within a former minerals processing site comprising an area of hard-standing surrounded by semi-improved grassland fields to the south with the A20 bordering the site to the north beyond which is a large arable field, the arable and semi-improved grazing extend to the east and west of the site bisected on a north – south basis as described by the A20. The application site is approximately 1km south of Sellindge, Kent, grid reference TR 111 366.

8.2 METHODOLOGY

The scope of this assessment, collection of baseline data, evaluation of ecological resources, description and assessment of the significance of impacts and identification of mitigation measures broadly follow guidelines set out by the Institute of Ecology and Environmental Management[1] and references therein. Undertaking the assessment in this manner satisfies the requirements of assessments for EIA developments.

[1] Institute of Ecology and Environmental Management (2006) *Guidelines for Ecological Impact Assessment*. IEEM, Winchester .

8.2.1 Data – Desk Study

Information on statutory wildlife sites within 2km of the application area has been obtained from published sources. Information on non-statutory sites and the presence of protected species near the site has also been sought through consultation with Kent and Medway Biological Records Centre (KMBRC), and the National Biodiversity Network (NBN) gateway[2].

8.2.3 Collection of Baseline Data – Field work

A baseline ecological survey of the site was undertaken on the 23rd October 2007. This survey was conducted by an Ecologist from SLR and comprised of an Extended Phase 1 Habitat survey with initial appraisal of habitats within the site and a 30m annulus for protected species including bats, reptiles and badger.

The Extended Phase 1 Habitat survey comprised an assessment of the ecological value and distribution of habitat within the site as a whole and aimed to identify and provide further information, through the use of Target Notes, on habitat features of particular value to different plant and animal groups.

Given the habitats and species present on the site and the extent of the proposed development no further survey work needs to be undertaken as long as there are no works scheduled to take place within 20 metres of the stand-off of the badger sett in the south-eastern corner of the application site. If for any reason works need to be undertaken within the standoff then further survey work will be required.

8.2.4 Constraints to Current Survey

It is considered that the level of detail gathered during this survey has been sufficient to assess the value of those habitats present and identify the potential impacts upon them, and to advise on an appropriate scheme of mitigation to ensure that future development activities can be undertaken without adversely affecting sensitive ecological receptors. Therefore no significant constraints to the current survey have been identified.

8.3 EVALUATION

The baseline information obtained has been used in undertaking an assessment of the value of ecological features within the study area. Ecological features are defined as:

- statutorily protected (Natura 2000 sites, SSSI, NNR) or locally designated (e.g. County Wildlife Sites) sites and features;

- sites and features of biodiversity value not designated in this way, e.g. areas listed on published inventory of priority biodiversity habitats (e.g. Ancient Woodland Inventory, lowland grassland inventory) or areas of habitat subject to UK or Local BAP targets; and

- species of biodiversity value or significance and their habitats, including those protected and controlled by law.

An evaluation of features each type of ecological feature has been based upon the IEEM guidelines[1].

[2] www.searchnbn.net

In addition, an assessment of the socio-economic value of features and species has also been made.

8.3.3 Impact Assessment

The assessment of ecological impacts follows the process described by the IEEM, which can be summarised as:

- identification of the range of potential impacts that may arise resulting from the proposed development;
- consideration of the systems and processes in place to avoid, reduce or mitigate the possible effects of these impacts;
- identification of the opportunity for ecological enhancement associated with the proposals;
- assessment of the residual impacts, following consideration of the success of avoidance, mitigation and enhancement measures; and
- where necessary, identification of compensation required to offset any significant residual effects.

As highlighted in the first section of this document, the significance of residual impacts is assessed on three separate levels. These can be summarised as:

- impacts upon biodiversity resources;
- consequences in terms of national and local nature conservation planning policy; and
- legal requirements relating to species and habitats.

8.4 ECOLOGICAL BASELINE

8.4.1 Contextual information

The application site is located approximately one kilometre south-east of Sellindge in Kent. The closest statutorily designated wildlife site is Gibbins Brook SSSI which is approximately 1.5km north of the application boundary, while Otterpool Quarry SSSI abuts the application boundary to the south and east, but received its designation for geological reasons. The application site is immediately adjacent to the A20 to the north and is set within an agricultural landscape with semi-improved grazing to the south and arable fields to the north.

8.4.2 Habitats

This section describes the habitats identified during the Extended Phase 1 Habitat survey, the location and distribution of which are shown in Drawing OP/10. Individual habitat features are identified on Drawing OP/10 as Target Notes, which are described in detail in Table 1.

Otterpool Quarry

Within the application site itself which is a former mineral processing site, the habitats present are as follows; an extensive tract of tipped hardcore dominates the majority of the application site, this habitat has yet to be colonised by plants and remains largely free of vegetation. The margins of the site are marked by vegetated bunds with hedgerows running along the north, east and part of the southern boundary. The eastern boundary has a wooded strip running north-south, this wooded area is dominated by semi-mature trees with a limited ground-flora.

Surrounding Areas

The application site is surrounded by agricultural land with arable land to the north and pasture to the south and immediately bounded by the A20 to the north.

Table 1 - TARGET NOTES

Target Note	Description
1	Lawson's cypress (*Chamaecyparis lawsoniana*) hedgerow bordering roadside, approximately 7 metres tall with occasional Scots pine (*Pinus sylvestris*) and elder (*Sambucus nigra*). Groundflora on the roadside of the hedge is dominated by perennial rye-grass (*Lolium perenne*), with occasional common nettle (*Urtica dioica*) and common ragwort (*Senecio jacobaea*). On the site side of the hedgerow the groundflora is limited due to shading and comprises occasional ground ivy (*Glechoma hederacea*) and black nightshade (*Solanum nigrum*).
2	Sandy embankment approximately two metres in height, covered in bramble scrub and tall ruderal species. Bramble (*Rubus fruticosus*), common nettle and bristly oxtongue (*Picris echioides*) are frequent with occasional common ragwort. On top of the bund is a poorly managed hedgerow comprising frequent elder and hawthorn (*Crataegus monogyna*) with a ground flora of

ground elder (*Aegopodium podagraria*) and red dead-nettle (*Lamium purpurea*).

3 Piles of tipped rubble some reaching three metres in height, largely un-vegetated apart from a sparse scattering of colonising species with very infrequent hoary mullein (*Verbascum pulverulentum*), welted thistle (*Cardus crispus*), ox-eye daisy (*Leucanthemum vulgare*), annual meadow-grass (*Poa annua*), common nettle, scarlet pimpernel (*Anagallis arvensis*), common ragwort and broad-leaved willowherb (*Epilobium montanum*).

4 Hard standing with crushed aggregate and concrete with scattered colonising species similar to target note (TN) 3 above.

5 Low earth bund along site boundary covered in ruderal vegetation species including abundant scentless mayweed (*Tripleurospermum inodorum*) and bristly oxtonge, frequent annual meadow-grass and occasional common comfrey (*Symphytum officinale*), prickly sow-thistle (*Sonchus asper*), common ragwort, hoary mullein, ground elder, creeping buttercup (*Ranunculus repens*) and ribwort plantain (*Plantago lanceolata*)

6 Semi-improved grassland field tightly grazed by rabbits around the margins with a 20 cm sward in the middle. Species present include perennial rye grass, creeping bent (*Agrostis stolonifera*), crested dogs-tail (*Cynosurus cristatus*), smooth meadow-grass (*Poa pratensis*) and cock's-foot (*Dactylis glomerata*) with occasional spear thistle (*Cirsium vulgare*) around the field margins.

7 Lawson's cypress hedge approximately 5 metres tall on top of earth bund. A line of immature ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*), elder, sycamore (*Acer pseudoplatanus*) and hawthorn has been planted on the south side of the hedge. The ground flora species present include dominant perennial rye grass, frequent Yorkshire fog (*Holcus lanatus*) and sweet vernal grass (*Anthoxanthum odoratum*) with occasional common ragwort, common comfrey, ribwort plantain, and autumn hawkbit (*Leontodon autumnalis*). On the northern side of the hedge the bank side has been excavated leaving a sheer drop of approximately 2 metres of un-vegetated sand.

8 An area of continuous scrub with dominant goat willow (*Salix caprea*), occasional elder and hawthorn, ground flora species present include common nettle, ground ivy and occasional periwinkle (*Vinca major*).

9 A seven entrance badger sett with four entrances showing recent signs of use such as guard hairs and bedding materials

10 Earth bund running along site boundary with grass and ruderal vegetation. Species present include frequent common ragwort, white clover (*Trifolium repens*), red clover (*T. pratense*), yarrow (*Achillea millefolium*), ribwort plantain, creeping thistle (C*irsium repens*), common nettle, ground ivy, butterbur (*Petasites hybridus*), bramble, bristly ox-tongue, very occasional European gorse (*Ulex europaeus*), greater burdock (*Arctium lappa*) and scattered scrub with hawthorn, sycamore, blackthorn (*Prunus spinosa*), hazel (*Corylus avellana*), ash, sweet chestnut (*Castanea sativa*) and elder. Also present was a mature golden poplar (*Populus* x *Canadensis*) and a semi-mature crack willow (*Salix fragilis*).

11 Wooded strip running along site boundary approximately 15 metres wide with sycamore, hawthorn, elder, downy birch (*Betula pubescens*), hornbeam (*Carpinus betula*), field maple (*Acer campestre*), crack willow and blackthorn.

12 Stand of mature golden poplar with contiguous bramble scrub underneath and broad-leaved willowherb.

13 Damp area in corner with pendulous sedge (*Carex pendula*) around the margins, no water present at the time of survey.

14 Scrubby hedge line of immature crack willow, hawthorn, ash, dog rose (*Rosa canina*) and elder.

15 Small asbestos clad building 2m x 4m in area, in a poor state of repair.

8.4.4 Flora

There is no indication or records from the local records centre or the NBN Gateway relating to the site to suggest that it is important for any protected, rare or notable botanical species and no such species were recorded during the Extended Phase 1 Habitat survey. Further to this, it is considered unlikely that the site will support a locally important population of any of such plant species given the nature of the habitat types present.

No 'pest' species from Schedule 9 of the Wildlife & Countryside Act 1981(WCA 1981), such as Japanese knotweed (*Fallopia japonica*) or giant hogweed (*Heracleum mantegazziannum*), were recorded.

8.4.5 Fauna

Mammals

Badger

During the site survey a seven entranced sett was recorded in the south east corner of the site (Target Note 9). Recent signs of occupation including fresh excavations, bedding material and hairs were recorded upon inspection of the sett entrances. Given the un-vegetated state of the majority of the application site it is considered unlikely that the application site is important for this species other than in the area occupied by the sett. The surrounding semi-improved grassland field is likely to provide an important foraging resource.

Records of badger (*Meles meles*) were obtained from KMBRC for locations within 2km of the site, the closest of which relates to a record of badger bait marking approximately 500m to the south east of the onsite sett which is likely to relate to the same social group. Other records predominately relate to the A259, approximately 1km to the east.

Bats

KMBRC and the Kent Bat Group hold records of eight species of bat feeding and roosting within the area surrounding the application site. However no records of roosts were returned within the same grid square as the application site or a 1km radius, which when considered in combination with the lack of buildings and mature trees within the application site, indicates that the site is not important for bats. A small building is present within the application site (Target Note 15), but given its construction, size and state of repair it is considered unlikely to provide suitable conditions for a roost for any species of bat. There were a number of mature and semi-mature trees around the site boundary that potentially

could support features such as cracks or splits which in turn could provide roosting opportunities for bats.

Water Vole

A single record of water vole (*Arvicola terrestris*) was obtained from KMBRC, for the Royal Military Canal some 2.4km south of the application site. However, as there are no water bodies present within the application site or in the local vicinity, this species is not considered to occur within the zone of influence and is not discussed any further in this report.

Harvest Mouse

KMBRC hold records for the BAP and red data book inventory species, harvest mouse (*Micromys nivalis*), approximately 700 metres north west of the application site. This species generally inhabits dense tall habitats such as reed beds, hedgerows, cereal crops and tall grasses, therefore given the lack of suitable habitats present within the application site and surrounding areas, this species is considered highly unlikely to be present within the zone of influence and so is not considered any further in this assessment.

Reptiles and Amphibians

KMBRC holds records of three reptile species and two amphibian species within the 2km search area, no records were obtained for the application site or its immediate surroundings.

A single record was obtained for grass snake (*Natrix natrix*) 2.25km north of the application site. Two records for slow worm (*Anguis fragilis*) were obtained, the closest to the application site being located 1.5km to the south-east. Two records for common lizard (*Lacerta vivipara*) were returned, the closest being 1.5km south of the application boundary. These records are all located at greater distances from the site boundaries than the expected home range for these species; therefore they are not considered to be relevant to the application site. Habitats within the site are also considered to be unsuitable to support these species; lacking the structural diversity to provide sufficient cover and prey.

Single records of great crested newt (*Triturus cristatus*) and common frog (*Rana temporaria*) were returned from the data search, being located 2.25km north of the application site. The home range of the great crested newt is generally considered to be no greater than 500m[3], although the vast majority of the population tends to occur within 150m of the breeding pond[4]; this record is therefore not considered to be relevant to the site.

No ponds are present within the site itself, however two ponds were identified within 500m of the site boundary, the closest of which is located 400m north of the site; however a stream and the A20 lie between this pond and the site, forming potential barriers to newt migration. The other pond is located approximately 500m to the south east however a large arable field between this pond and the site itself is likely to act as barrier to newt migration between these locations. Other smaller ponds may be present closer to the site, however habitats within the site itself are generally considered to be unsuitable for great crested newt, even in its terrestrial phase. This species tends to favour areas of structurally diverse grassland and scrub, and avoids open areas of bare ground, where it is more susceptible to predation and desiccation.

[3] English Nature (2004) *Great Crested Newt Mitigation Guidelines*. Natural England, Peterborough.

[4] Edgar, P. and Griffiths, R A. (2004) *An Evaluation of the Effectiveness of Great Crested Newt Translocation as a Tool for Mitigation*. Natural England, Peterborough.

Birds

Extensive records of birds were obtained from KMBRC including some 45 amber list species and 16 red list species. None of these records relate to the application site itself, however five amber list species and a single red list species were recorded at Westernhanger racecourse half a kilometre to the east of the application site. During the survey a single RSPB amber list species, green woodpecker (*Picris veris*), was recorded at the site.

Habitats within the site are generally considered to be unsuitable for breeding birds; lacking the dense vegetation favoured by most species. However tree lines and hedgerows around the margins of the site do have potential to support low densities of urban fringe and garden species. The historical use of the site as a highways depot and its proximity to the busy A20 road would also suggest that bird species using the site are likely to be rather tolerant of regular disturbance.

Invertebrates

KMBRC holds a number of records for notable invertebrate species within the search area with many red data list inventory species being present within the locality however none of these records relate to the application site and its immediate surroundings.

There was no evidence to indicate the presence of any other protected or notable invertebrate species within or adjacent to the application area. Given the current nature of the habitats at the site and its historical use, it is considered highly unlikely that the site would support a diverse invertebrate species assemblage.

Other Species

There are no other records for protected, rare or notable species within the site. Also, given the nature of the habitats recorded during the survey, it is considered unlikely that the site would be critical or important for any other species or populations in its current condition.

Ecological Processes and Trends

If the site was left undeveloped and unmanaged it would continue to be colonised by ruderal species and grasses in the short to medium term, while depending on the level of rabbit grazing it would either form unimproved grassland or ruderal and scrub habitats in the long term.

8.5 EVALUATION OF ECOLOGICAL FEATURES

8.5.1 Criteria for Evaluation

Recent IEEM guidelines (2006)[1] suggest that to ensure a consistency of approach, ecological features are valued in accordance with their geographical frame of reference as follows:

- International;
- UK;
- National (England);
- Regional (South East);
- County (Kent);
- District (Shepway);
- Local or Parish; and/or
- Within immediate zone of influence only (less than local value).

These categories are then applied to the features identified in baseline surveys and desk-top studies. Some features can already be recognised as having ecological value and as such they may be designated as a statutory or non statutory wildlife site, other features may require an evaluation based upon their previously un-assessed biodiversity value. The rationale for grading such features is provided below.

8.5.2 Designated Sites

Natural England notifies sites that are of international or national importance for nature conservation as Sites of Special Scientific Interest (SSSIs), although some sites that are of national importance for certain species have not been so designated. Internationally important sites may also be designated as Special Areas of Conservation, Special Protection Areas or Ramsar sites. In some instances a site that is considered to be of national importance can also be purchased by Natural England and designated as a National Nature Reserve.

Areas of Outstanding Natural Beauty (AONB) were created under section 87 of the 1949 National Parks and access to the countryside act, with a view to conserve and enhance the natural beauty of the areas concerned. Under the act local authorities can devise and implement local management plans.

Kent Wildlife Trust recognises areas of land that are of county importance for nature conservation as Local Wildlife Sites (LWS). Though these areas are not protected by law it is a requirement of the planning process that any impacts upon them from an application are considered when making a planning decision.

8.5.3 Undesignated Features of Biodiversity Importance

Habitat Value

For features that have not been formally recognised by a designation, SLR has undertaken an evaluation based upon those guidelines suggested by the Institute of Ecology and Environmental Management. The features being evaluated are considered in the context of the site and locality. In this way it is possible to provide a more accurate assessment of the impacts in the locality.

Value for Species

The criteria used to determine the biodiversity value of a species or features that may support a species include the following general considerations:

- rarity at a geographical level (international, national or local);
- endemism and locally distinct varieties or sub-species;
- species on the edge of geographic range;
- size of populations in the local geographical context;
- species-rich assemblages of a larger taxonomic grouping, e.g. herpetofauna or wintering birds;
- plant communities, ecosystems or habitat mosaics/associations that provide habitat for any of the above species or assemblages; and
- populations of species considered as significant under locally published guidelines or red data books.

All species and populations of species, including those with statutory protection, are evaluated on the same basis. It should be noted that even when a species, great crested newt for example, is protected under European and UK statute, the presence of a small population on a site within a region where this species is widespread is unlikely to be assessed at a value of greater than district level importance. Equally, a particular feature on a site may attract large numbers of an unprotected species that has limited distribution and this may represent a feature of regional importance.

Social, Community or Economic Value

Some areas of habitat/species may not be particularly rare or of high ecological value in their own right but they may be of social or community value for a neighbourhood/community that has the use of such an area for recreational or educational use (nature trails for example). In addition to this some wild populations of animals may also be of economic value such as red grouse on heather moors that can be shot or trout in rivers that are fished, or even significant populations of birds that may attract bird watchers to a region.

Such an assessment is however centred upon those populations and areas that are considered to be natural or semi-natural.

8.5.4 Evaluation

Designated Sites

Table 2 lists the designated sites of ecological value in the study area. Statutory site and non- statutory site designations were provided by KMBRC.

Otterpool Quarry SSSI

Otterpool Quarry SSSI is designated for geological reasons due to the sections through the Cretaceous Hythe Beds and of particular significance in showing the contact of this formation and the Sandgate Beds above. The Hythe Beds are especially fossiliferous at this locality and rich in ammonites which make it a key stratigraphic locality.

Lympne Escarpment SSSI

Lympne Escarpment SSSI consists of a steep Kentish ragstone escarpment with the grassland and woodland associated with it representing some of the best examples of these semi-natural habitats of ragstone in Kent. Lympne Park Wood is the largest remaining ash coppice woodland on the escarpment, thought to be of ancient origin. Predominantly ash, field maple and hazel coppice over a characteristic calcareous shrub layer of wayfaring tree (*Viburnum lantana*), spindle (*Euonymus europaeus*) and privet (*Ligustrum vulgare*). Some good examples of calcareous grassland are also present.

Gibbins Brook SSSI

Gibbins Brook SSSI is an area of marshy grassland that retains many characteristics of a bog, which is notable for its invertebrates. Patches of bog vegetation still remain with purple moor grass (*Molinia caerulea*), *Sphagnum* sp. moss species and bogbean (*Menyanthes trifoliata*) being present. Also important is the alder carr woodland that is present with a ground flora of fen plants such as opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*), marsh-marigold (*Caltha palustris*) and yellow flag (*Iris psuedoacorus*), dry acidic grassland is found to the east of the site while hedgerows of oak, birch and hawthorn can be found in places around the perimeter of the site.

TABLE 2 - DESIGNATED SITES AROUND OTTERPOOL QUARRY

Level of Value	Site / Feature at this Value	Location (from edge of application	Reason for Importance
International			
	Otterpool Quarry SSSI	Adjacent to the application boundary	Designated for geological reasons, site displays the finest section through the Cretaceous Hythe Beds and the Sandgate Beds above.
	Lympne Escarpment SSSI	1.6km south	Among the best remaining example of grassland and woodland habitats on rag stone in Kent with diverse plant species.
National			
	Gibbins Brook SSSI	1.5km north	Marshy grassland retaining bog characteristics. Alder carr with a ground flora containing a number of fen plants. Also notable for invertebrates in particular moths
	Kent Downs AONB	1.5km south-east	Kent Downs was designated as an AONB due to its mix of chalk escarpments, dry valleys, historical hedgerows, ancient woodlands, unique wildlife, and its many site of historic and cultural interest.
County	Harringe Brooks Wood	750 metres west	No information available.

Pasture and woods below Court-at-street	1900 metres south-west	No information available.
Royal military canal	2.2km south	No information available.
Folks wood	1.75 km east	No information available.

Undesignated Sites

Features within the application area are all considered to be of less than local value.

TABLE 3 - ECOLOGICAL FEATURES WITHIN OTTERPOOL QUARRY

Level of Value	Site / Feature at this Value	Location	Reason for Importance
District	-	-	-
Local	-	-	-
Less than local	Bramble scrub	Around the site boundary	Areas offering limited opportunities for wildlife
	Wooded margin	Along the eastern site boundary	Areas offering limited opportunities for wildlife

Access to the site is limited and does not contain habitats that are considered to be of social or community value.

The bramble scrub and woodland around the site boundaries offer some potential for nesting birds, and the presence of a badger sett in the south east corner of the application site needs to be considered during the construction of the proposed development.

It is also considered unlikely that the application site is important for, or critical for any protected, rare or notable species. None of the habitats recorded are likely to support an important population of common or economically important species.

8.6 POTENTIAL IMPACTS

8.6.1 Assessment Methodology

To assess the effects of a proposed development it is essential that the impacts that could arise are identified and characterised. The range of impacts that require consideration in the ecological impact assessment are based upon knowledge of the proposed development and knowledge of the receptors (features of ecological significance). This can only be undertaken with a thorough understanding of ecological processes and how flora and fauna react to the range of impacts that could occur.

8.6.2 Potential Impacts

Potential impacts are characterised in terms of their direction, permanence, certainty and reversibility. An assessment is also made of the likely significance of the impact prior to mitigation, and the significance of the residual impact, i.e. after all agreed mitigation is implemented. The degree of confidence in the likely success of mitigation, based upon published studies and the experience of the assessor, is also made and any uncertainties are clearly expressed. This impact assessment is summarised in Table 5.

8.6.3 Mitigation, Enhancement and Additional Compensation

This section provides details of the mitigation measures that have been incorporated into the scheme to minimise identified impacts and it also describes those ecological enhancements or compensation measures that have been incorporated into the scheme design.

8.6.4 Assessment of Significance

The final section analyses the magnitude and significance of the residual effects of this scheme following mitigation in terms of their significance from an ecological perspective and also the implications of those effects from a legal and policy perspective.

8.7 CHARACTERISATION OF POTENTIAL IMPACTS

8.7.1 Proposed Scheme

The proposed scheme involves the creation of an anaerobic digestion plant and materials recycling/transfer facility at Otterpool quarry, near Sellindge, Kent. The facility will comprise a materials recycling facility along with an anaerobic digestion plant with associated office, parking and welfare facilities. The site access will use the current access with the addition of two weighbridges.

8.7.2 Potential Construction Impacts

The development of the site is anticipated to result in a range of short term impacts. The following predicted construction impacts have been identified and are discussed in the following section:

- Habitat loss, fragmentation and isolation through land-take;
- Indirect effects upon fauna through habitat loss, fragmentation and isolation;
- Alterations to surface water flow and quality;
- Noise and visual disturbance;
- Pollution; and
- Dust deposition.

Habitat Loss, Fragmentation and Isolation through Land-Take

Habitat loss involves the direct destruction or physical take-up of vegetation, or other structures of conservation interest, such as dead wood or bare ground. Habitat loss may also occur as a result of a change in land or water management, for instance the drying-up of ponds or successional events leading to a change in habitat type.

Habitat loss can result in the direct loss of individuals or populations of plant or animal species. It may also cause other populations to become demographically unstable or unsustainable, due to loss of prey species or habitat niches.

Fragmented and isolated habitats are likely to be more vulnerable to external factors that may have a negative affect upon them; e.g. disturbance, and may be less resilient to change, including climate and management change; than connected habitats because colonising species may be unable to reach the habitat. Due to the complexities of ecological systems, it is not possible to quantify the potential effects that may occur to isolated habitats. The potential effects upon fauna associated with fragmented habitats are considered in the next section.

The development will result in the loss of the un-vegetated hard core that makes up the floor of the majority of the site. Vegetated bunds, scrub and wooded margins around the perimeter of the site will be un-affected by the proposed development apart from a small area of the Lawson's cypress hedgerows either side of the access that will be lost when the site access is widened. The badger sett highlighted by Target Note 9 will also remain unaffected by the proposed works. Therefore the direct effects of habitat loss through land take are considered to be negligible.

Indirect Effects upon Fauna through Habitat Loss, Fragmentation and Isolation

The area inside the development footprint is considered to be of negligible ecological value and as such it is anticipated the loss of these habitats would not have any indirect effects upon species and habitats in the surrounding area.

Alterations to Surface Water Flow and Quality

There are no water courses or water bodies within the application site and the closest river is the East Stour approximately 300 metres north of the application boundary, while there is a spring some 100 metres to the west of the application boundary. Surface water from the site is likely to flow in a northerly direction towards these water courses given the topology of the surrounding land. Therefore during the construction phase, run-off from stored materials, and machinery could potentially cause pollution of these watercourses. This in turn could have an impact upon sensitive aquatic invertebrate fauna and other species within these and other waterbodies further downstream. However, run-off from the site is likely to be intercepted by the drainage system for the A20 to the north of the site, where it would be discharged to storm drains and treated before being released into natural water courses.

Noise and Visual Disturbance

Increased noise levels during the construction phase has the potential to have a negative effect through the disturbance of wildlife within the site and surrounding areas. This is likely to be most significant for disturbance to sensitive species, notably birds and badger.

Some species of bird are likely to be more vulnerable to noise and visual disturbance than others. For example, an analysis of the responses of certain bird species to disturbance

found that a passive, low-level and continuous disturbance is likely to lead to habituation and active, high level and continuous disturbance is likely to lead to the displacement of many bird species from the disturbed area, leaving only very tolerant species (Hill et al., 1997).

Westernhanger racecourse has records of several RSPB Amber listed species and the red listed species Yellowhammer (*Emberiza citronella*). Green woodpecker, an Amber listed species was also heard during the site survey. Nonetheless, the habitats present within the application site are unlikely to be important for any of these species. The majority of the Amber listed species recorded were waterfowl recorded within the racecourse. There are no waterbodies within the application site or large areas of grassland commonly required for these species to forage upon and they are therefore highly unlikely to occur on site. Yellowhammer could potentially utilise the scrub and woodland strip on the edge of the site for nesting, however as these habitats will be unaffected during the development and are widespread throughout the wider landscape surrounding the application site, it is considered that while individuals within the site could be affected by increased levels of noise and visual disturbance there will no be adverse impact on this species due to the abundance of suitable habitat within the wider landscape.

It is possible that during the construction phase of the site development the badgers in the sett identified in the south eastern corner of the application site will undergo a degree of disturbance, both in terms of elevated noise levels and visual disturbance. However the sett will be fenced off at a distance of 20 metres from the sett entrances to help minimise the level of disturbance experienced by the badgers.

Dust

Dust can potentially be generated during several stages of the construction process from the initial soil stripping of the site through to construction of site infra structure. Though dust suppression methods significantly reduce the deposition of dust in the locality, they cannot eliminate it. Fugitive dust from development sites is typically deposited within 100-200m of the source; the greatest proportion of which comprise larger particles (greater than 30 microns) is deposited within 100m. Where large amounts of dust are deposited on vegetation over a long time scale (a full growing season for example) there may be some adverse effects upon the plants' photosynthesis, respiration and transpiration. Furthermore it can lead to phytotoxic gaseous pollutants penetrating the plants. The overall effect would be a decline in plant productivity, which may then have indirect effects on fauna. The amounts of dust deposited and its effects are also dependent upon weather conditions as in wet weather less dust will be generated and that which has been deposited upon foliage is likely to be washed off.

There are no designated sites or sensitive habitats within close enough proximity to the application site to be affected by any dust generated during the construction phase of the proposed development, nor are there any sensitive species within the application site itself. Given that the site is currently dominated by areas of bare earth, the proposed development is unlikely to cause a significant increase in the levels of dust generated at the site.

8.7.3 Potential Operational impacts

Alterations to Surface Water Flow and Quality

The completed development will feature areas of impermeable concrete hard-standing and buildings increasing the amount of surface run off from the site. However, given the relatively small area of impermeable surfaces proposed and the lack of sensitive habitats present within the locality of the site no impacts from changes to the surface water flows are anticipated.

The proposed development could potentially be a source of accidental pollution incidents through run-off from the proposed waste transfer station and leaks from the digester tanks. Pollution from these sources could potentially enter watercourses to the north and cause a reduction in their water quality, which might in turn have an impact upon aquatic invertebrates and other sensitive fauna. However, the proposed drainage scheme should ensure that run-off from the proposed development is discharged from the site at appropriate rates and qualities, for full details of the hydrological impact of the proposed development please refer to Appendix D of the Planning Statement.

Noise and Visual Disturbance

The operational stage of the anaerobic digestion plant and waste recycling/transfer facility will involve the regular receipt of waste material, delivered by vehicles. This will increase the level of noise related disturbance above the sites current baseline. Potentially sensitive receptors might include breeding birds, however given the proximity of the site to the A20 and previous disturbance levels associated with the use of the highways depot, such species are likely to be acclimatised to a relatively high level of background disturbance. Badgers using the sett in the south eastern corner of the site could potentially be disturbed by increased levels of human activity at the site, particularly where this is in close proximity to the sett.

Dust

During the operational stage dust could potentially be generated through several activities taking place within the site such as the receipt of waste and recyclable materials and the vehicle deliveries themselves. Should dust become a serious issue then standard dust suppression methods will be put in place.

8.8 MITIGATION

This section outlines the mitigation measures that have already been incorporated into the proposed scheme. Following this, recommendations for further mitigation measures are suggested. Recommendations for further mitigation are based upon what is practicable and 'reasonable' and would not affect the integrity of the proposed development.

8.8.1 Mitigation Incorporated into Scheme

The proposed development incorporates a number of procedures and has put safeguards in place to monitor and mitigate the risk of pollution, dust generation and to control the quality and quantities of surface water discharged from the site.

Potential Impacts upon Statutory Wildlife Sites

No statutory wildlife sites are considered to be close enough to the application site to be affected by the proposed development; therefore no mitigation is proposed for statutory sites.

Non Statutory Wildlife Sites and Other Sensitive Ecological Receptors

No non-statutory wildlife sites are considered to be close enough to the proposed development site to be affected; therefore no mitigation is proposed for non-statutory sites.

Protected Species

<u>Breeding Birds</u>

The nests of wild birds, regardless of how common the species are, are protected under the Wildlife and Countryside Act 1981 (WCA 1981) (as amended) whilst they are occupied or being built. All clearance of habitats that could provide nesting opportunities for wild birds would be undertaken outside the breeding season to ensure that no active nests are disturbed. If clearance work is required to take place during the breeding season then pre-clearance checks need to be carried out by a suitably qualified ecologist. Should active nests be discovered at this time, potentially damaging works within the vicinity of the nest would be suspended until such a time as the breeding attempt was complete.

Badgers

Badgers are protected by the Protection of Badgers Act 1992. Under this Act badgers and their setts are protected from disturbance or destruction and if activities such as the use of heavy plant, need to be undertaken within the vicinity of a sett then a disturbance licence will be required from Natural England. Recently the guidelines have changes from a stand off of 30 metres to a stand off of 20 metres, meaning that so long as none of the activities mentioned previously take place within the 20 metre standoff then a disturbance license is not required.

An active badger sett was identified in the south eastern corner of the application site during the Extended Phase 1 Habitat survey. At the current time no works are proposed to take place within a 20 metre stand off of the sett, which will be fenced for the duration of the construction works. 20 metres is considered to be a sufficient distance as the sett is dug into an earth bank on the edge of the site, which is higher than the proposed development footprint on the quarry floor. Should for any reason works which could damage or destroy a sett be required then a scheme of exclusion and sett closure will need to be undertaken to ensure that no badgers are trapped underground by tunnel collapse. Further surveys to assess the importance of the site for the local badger clan would need to be undertaken and to look for other setts within the surrounding area. If no other setts are present within the territory of the badger clan to be affected then an artificial sett may need to be created. Sett exclusions require a licence from Natural England which are issued on a case by case basis. It is also recommended that prior to the start of development, survey data is updated to establish if any additional setts have been excavated closer to the proposed development footprint, which would affect the location of the stand-off area. Following the construction works, the setts should have a shrubby screen planted between it and the active site to provide cover. The planting should contain species such as hazel, crab apple and hornbeam which will also provide a foraging resource for the badgers in the area.

Dust generation

Standard dust suppression methods will be used during the construction phase and during the operation of the completed site, and dust generation and deposition levels will be monitored.

Pollution

Working practices during the construction and operational phase of the development will reduce the likelihood of a pollution incident and protocols are in place to manage such an incident should it occur.

Surface water flows

The discharge of surface water from the site will be at a rate and of a quality in line with current guidance. All surface water runoff will be kept separate from any runoff from maturation pads to ensure no cross contamination between the two water sources. A

surface water management plan will be created to ensure the surface water is control and discharged off site at existing levels.

No other mitigation measures are considered necessary for protected species.

8.8.2 Further Recommended Mitigation and Enhancement

Given that the mitigation measures already incorporated into the proposed development address potential impacts upon protected species it is concluded that no further mitigation measures are required in regard to these species.

Due to the careful design and planning of the development and through consideration of the mitigation incorporated into the scheme it is concluded that all reasonable and practicable steps have been taken to avoid significant adverse effects upon features of nature conservation importance and protected species. No further recommendations have been deemed appropriate.

8.9 ASSESSMENT OF RESIDUAL IMPACTS

Table 5, below, identifies the range of identified ecological receptors that could potentially be subject to those potential impacts that could occur as a result of this development. When describing the nature of the impacts the descriptors set out in Table 4 are used.

Table 4 provides a summary of the aspects of the impacts that need to be established and considered when the significance of the impact is assessed. These factors are outlined in the impact assessment table (Table 5).

Table 4 - Key Considerations when Characterising Impacts

Descriptor	Definition[5]
Direction of impact	Positive or negative impact
Probability of occurring	Broadly defined on 3 levels: Certain, Probable or Unlikely
Complexity	Direct, Indirect or Cumulative
Extent and Context	Area/number effected and % of total
Magnitude	Describe severity of effect in words
Duration	Permanent or Temporary in ecological terms (e.g. within the lifetime of the species effected)
Reversibility	Whether or not the effect can be reversed in an ecological timescale
Area	Expressed as area or percentage of the study area.

[5] Definitions for these terms and further information relating the methods of assessment are given in Guidelines for Ecological Impact Assessment (IEEM, 2006)

TABLE 5
ASSESSMENT OF POTENTIAL IMPACTS AND MITIGATION

Important Ecological Feature	Description of Potential Impact	Characterisation of Impact	Ecological Significance of Impact if unmitigated	Mitigation and Compensation Proposals	Residual Impact following Mitigation and Significance
Construction Impacts					
Otterpool quarry SSSI Geological SSSI	Deposition of small quantities of dust arising from quarrying operations	Negative Probable Indirect Temporary In extreme cases could change composition of plant communities through smothering or changes to soil chemistry, likely to be reversible	Not significant	Adoption of dust suppression techniques and monitoring of dust generation/deposition	Not significant
Trees and scrub on site margins Habitats of no greater than local value	Disturbance through increased activity and noise	Negative Probable Indirect Permanent	Significant at Local level	Additional area of tree planting proposed.	Not significant

Important Ecological Feature	Description of Potential Impact	Characterisation of Impact	Ecological Significance of Impact if unmitigated	Mitigation and Compensation Proposals	Residual Impact following Mitigation and Significance
Badger population	Disturbance of the sett during construction works	Negative Probable Direct Temporary	Significant to local badger clan	A stand off zone of 20 metres from the setts and a pre-construction check up to ensure there no new setts have been dug closer to the development.	Not significant
Breeding Bird Assemblage District level importance Protected whilst breeding under WCA 1981	Disturbance/destruction of breeding birds and their nests	Negative Unlikely Direct Temporary Would occur during construction works	Significant to local populations of common species	Avoid areas of scrub and if any areas of scrub or trees need to be removed time works to avoid breeding season, otherwise a qualified ecologist is required to conduct pre-clearance checks	Not significant
Operational Impacts					
Otterpool Quarry SSSI	Deposition of small quantities of dust arising from site operations	Negative Unlikely Indirect	Insignificant	Adoption of dust suppression techniques and monitoring of dust generation/deposition	Not significant

Important Ecological Feature	Description of Potential Impact	Characterisation of Impact	Ecological Significance of Impact if unmitigated	Mitigation and Compensation Proposals	Residual Impact following Mitigation and Significance
		Temporary In extreme cases could change composition of plant communities through smothering or changes to soil chemistry, likely to be reversible			
Badger population	Disturbance through site operation	Negative Unlikely Indirect Temporary In extreme cases could result in the abandonment of the sett	Significant at local Level	20 metre stand off zone fenced around the sett	Not significant
Potential Breeding Bird assemblage	Disturbance through site operation	Negative Unlikely Indirect	Significant at local Level	Habituation to disturbance will occur over time and existing disturbance from A20 would indicate the absence of sensitive species. Incorporation of	Not significant

Important Ecological Feature	Description of Potential Impact	Characterisation of Impact	Ecological Significance of Impact if unmitigated	Mitigation and Compensation Proposals	Residual Impact following Mitigation and Significance
		Temporary		additional tree planting will increase the availability of nesting habitat in the area.	

8.10 SIGNIFICANCE OF IMPACTS

This section summarises the significance of impacts in both policy and legal terms.

During the constuction phase of the proposed development, the following impacts have been highlighted;

- Dust deposition on Otterpool quarry
- Disturbance of trees and scrub on the site margins and the potential breeding bird population that utilise it as a nesting resource,
- Disturbance of the badger population identified in the south east corner of the site.

During the operational life of the proposed development it is anticipated that the following impacts could occur;

- Dust deposition on Otterpool quarry
- Disturbance of trees and scrub on the site margins and the potential breeding bird population that utilise it as a nesting resource,
- Disturbance of the badger population identified in the south east corner of the site.

Following mitigation of the above impacts it is considered that the proposed development would not have any negative impacts on important ecological features within or in the near vicinity of the application site.

8.11 LEGAL IMPLICATIONS

8.11.1 Statutory Wildlife Sites

No statutory wildlife sites are expected to be impacted upon by the development as all such sites are considered to be located too far from the application site. Otterpool quarry SSSI abuts the application boundary to the south and east but is designated for geological reasons which would not be impacted upon by the proposed development.

8.11.2 Non-Statutory Wildlife Sites

The closest non-statutory wildlife site is the LWS, Harringe Brook Wood. Given that this LWS is approximately 750 metres away from the application site and hydrologically unconnected, no impacts are anticipated on this site. No other non-statutory sites are expected to be impacted upon by the development.

8.11.3 Protected Species

Integrated into the proposed development is a strategy to firstly avoid harm to protected species and potential impacts upon their populations. Should it become necessary for these species to be disturbed then the appropriate licences/consents for that species would be applied for and the work carried out following best practice guidelines.

8.12 POLICY IMPLICATIONS

Through careful consideration of the potential impacts of the proposed development and the mitigation that could be adopted to reduce these it is concluded that the proposed development complies with current planning policy.

8.12.1 Statutory wildlife sites

No statutory wildlife sites are expected to be impacted upon by the development as all such sites are considered to be located too far from the application site. Otterpool quarry SSSI abuts the application boundary to the south and east but is designated for geological reasons which would not be impacted upon by the proposed development. As such the development complies with policy 6 of the Kent and Medway Structure Plan (KMSP) 2006 which states:

Development will not be permitted where it would directly, indirectly or cumulatively, materially harm the scientific or nature conservation interests of any of the following categories of sites:

• a European site;

• a proposed European site;

• a Ramsar site;

• a Site of Special Scientific Interest;

• a National Nature Reserve

The EcIA has demonstrated that no impacts upon statutory wildlife sites are anticipated as a result of the proposed development. As such, there are no policy implications for the current planning application relating to statutory sites.

8.12.2 Non-Statutory Wildlife Sites

The closest non-statutory wildlife site is the LWS, Harringe Brook Wood. Given that this LWS is approximately 750 metres away from the application site and hydrologically unconnected, no impacts are anticipated on this site. No other non-statutory sites are expected to be impacted upon by the development, meaning that the proposed development complies with KMSP Policy EN7 which states:

Development which would materially harm the scientific or nature conservation interests, either directly, indirectly or cumulatively, of:

• Local Nature Reserves

• County Wildlife Sites identified in Local Development Documents

• Regionally Important Geological/Geomorphological Sites

will not be permitted unless there is a need which outweighs the local nature conservation or geological/geomorphological interest and adverse impacts can be adequately compensated.

The EcIA has demonstrated that no impacts upon non-statutory wildlife sites are anticipated as a result of the proposed development and as such there are no policy implications for the current planning application relating to non-statutory sites.

8.12.3 Protected Species

Integrated into the proposed development is a strategy to firstly avoid harm to protected species and potential impacts upon their populations. Should it become necessary for these species to be disturbed then the appropriate licences/consents for that species would be applied for and the work carried out following best practice guidelines.

The development therefore complies with Policy EN8 of the Kent and Medway Structure Plan 2006 (KMSSP) which states:

Development likely to have an adverse effect directly or indirectly or cumulatively on important habitats or species will not be permitted unless, any adverse impact on an important nature conservation resource can be adequately mitigated and/or compensated.

Overview of Impacts

The assessment of impacts has identified that the proposed development would result in the potential disturbance of the badgers resident in a sett in the south eastern corner of the site, but that the level of disturbance is not significant at a local level. No other residual impacts associated with the proposed development are anticipated.

8.13 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Countrystyle Recycling; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

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SI

Issues

OFFICE

PARKING FOR 26 CARS

SITE ENTRANCE

ATTENUATION POND

PARKING FOR HGV'S

WEIGHBRIDGE

RECYCLING BINS BAILERS

FINISHED PRODUCT

MATERIALS RECYCLING / TRANSFER STATION

WEIGHBRIDGE

BELTS /SCREENERS /SORTING LINES

ANAEROBIC DIGESTION FACILITY

ATTENUATION POND

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

LEGEND

- LAND UNDER APPLICANTS CONTROL
- A — ARABLE
- HEDGEROW
- WOODLAND / TREES
- BUILDINGS
- ROAD
- HARDSTANDING
- SCATTERED SCRUB
- CONTINUOUS SCRUB
- TALL RUDERAL
- SI — SEMI-IMPROVED
- ATTENUATION POND
- BADGER SET
- 11 — TARGET NOTE

Revision	Issue Date	Issued By	Comments
1	DEC 08	CH	
0	MAR 08	CH	

COUNTRYstyle RECYCLING — WASTE MANAGEMENT SOLUTIONS

Site: OTTERPOOL QUARRY

Project: PLANNING APPLICATION

Drawing: **Habitat Plan and Proposed Site Layout**

Date: DECEMBER 2008

Scale: 1:1,000

Drawing No. **OP/10**

Paper Size: ISO A3 OP-10_409-1376-00002_1_PL 402 CB

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Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 9 Cumulative Impact Assessment

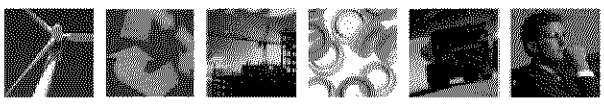
COUNTRYstyle RECYCLING

WASTE MANAGEMENT SOLUTIONS

July 2009

solutions for today's environment

CONTENTS



9.0 INTRODUCTION

This chapter is intended to assess the potential cumulative impact generated by the proposed development. Throughout the technical chapters and associated appendices contained within the Environmental Statement, appropriate criteria have been used to assess the impact that the development could potentially have on the site and the surrounding area. This chapter draws together the findings of all the assessments and outlines whether any cumulative impacts may emerge from the interaction between different environmental impacts.

Cumulative impacts relate to the way in which different impacts can affect a particular environmental resource or location incrementally, for example, combined noise, dust and traffic emissions on a dwelling from a new road scheme.

In essence, cumulative impacts are those which result from incremental changes caused by other past, present or reasonable foreseeable actions together with the projects. Therefore, the impacts of the proposed development cannot be considered in isolation but must be considered in addition to impacts already arising from existing or that may arise from planned development.

The application site is currently redundant i.e. no operations are taking place at the site. Existing developments within the vicinity of the site include Link Park (approx 1km to the south) and the small settlements of Lympne, Barrow Hill and Newingreen. Aside from these built developments, the surrounding area is dominated by arable fields and woodland.

Each technical discipline (air quality, landscape, traffic, noise, hydrology and ecology) have identified the potential impacts of the construction and operation of the proposed development.

Air Quality

A robust assessment of the air quality impacts of the proposed development on the site and surrounding area was undertaken. Baseline air quality was monitored at 7 potentially sensitive receptors and the potential impacts of dust, odour and vehicle pollutants from the proposed development on these receptors was assessed against baseline air quality.

The assessment concluded that the air quality effects of the development on the seven receptors and therefore the area within the vicinity of the site will be negligible. Therefore, it is concluded that the proposed development would not lead to a deterioration in local air quality and thus cannot be considered to have an adverse cumulative impact on local air quality.

Landscape

KCC'S Landscape Officer has commented that to the south of the application site, the Kent Downs AONB descends southwards, preventing vies of the site. Clear views of the site from the east are prevented by intervening vegetation and existing

development on Stone Street. Whilst the site may be visible from higher ground within the AONB to the north, views would be distant and set within the context of the M20 and railway line. The Landscape Officer considered the location suitable in terms of utilising a derelict site and felt that the industrial park to the south set a precedent for integrating large buildings within the broader area. For these reasons, the cumulative impact of the proposed development in terms of visual impact is not considered to be significant.

Traffic

The traffic and transport implications of the proposal were assessed as to their impact on the local road network.

The development would receive wastes from East Kent and would generate approximately 152 two-way HGV movements per day, averaging around 16 movements per hour. The application site is well located in terms of access to the strategic road network and all HGV traffic, with the exception of very local trips, would be routed east from the site access to access the M20 at Junction 11. The route passes minimal development and avoids the villages of Sellindge and Barrowhill.

The A20 has a high proportion of HGV use and is an established freight route for vehicles travelling between the M20 and Link Park, Lympne. It is recognised that the development at Link Park will increase traffic flows on the A20 and therefore increase traffic through the proposed site access junction.

A Transport Assessment was undertaken for the approved but not yet built, and existing built development at Link Park. The forecast traffic movements from Link Park were incorporated into the traffic assessment for the proposed development .
Peak hour HGV traffic generated by the proposed AD/MRF development was based on the worst case scenario of 22 HGV movements during the peak hour periods.
The traffic assessment concluded that the site access junction would operate adequately in the future, with minimal queuing and driver delay.

Overall, it was considered that the traffic flow increases at the site entrance during construction and operation would not have an adverse cumulative impact on the surrounding road network.

Noise

To provide an indication of the cumulative impact of noise, the predicted operational noise levels of the proposed development have been assessed against the existing ambient noise levels at each receptor.

The noise levels from the on-site noise sources have been assessed against standards appropriate for each noise source. A BS4142 assessment of noise from the fixed plant has shown that the weekday and weekend operations will lead to a situation of 'complaints unlikely'.

The ambient noise assessment has shown that, with the recommended mitigation measures, the impact on ambient noise levels will be at worst, slight and barely perceptible.

In summary, the proposed development will have a negligible effect on the identified receptors and as such it is concluded that there would be no cumulative impact with regard to noise in the vicinity of the site.

Geology, Hydrology and Hydrogeology

The groundwater and surface water regimes at the proposed development site have been assessed with reference to information held by the British Geological Survey, the Environment Agency, Local Authorities and others.

The Environment Agency have confirmed that the site does not fall within a Source Protection Area and the nearest Source Protection Area is approximately 1.9km east of the site. There are no licensed groundwater abstractions within 2km of the site.

The site lies within Flood Zone 1 (low risk) and has less than 0.1% annual probability of flooding each year. The potential impacts of the proposed development upon the hydrogeological and hydrological environments have been identified and assessed, and where appropriate, mitigation measures have been accommodated into the design of the development.

Overall, it is concluded that, with respect to geology, groundwater and surface water, there are no significant residual impacts of the development after consideration of the identified mitigation measures.

As all operations will take place undercover and/or on hardstanding that drains to a sump it is not considered that there will be any cumulative impacts on groundwater pollution from this development. The surface water drainage scheme proposed for the site will provide on site water storage and thus not increase runoff from the increased area of hardstanding and increase the risk of flooding off site.

In summary, it is not considered that the proposed development will generate a negative cumulative impact on the local water environment.

Ecology

The site has no statutory ecological designations, however, Otterpool Quarry SSSI is adjacent to the site and the Lympne Escarpment SSSI and Gibbins Brook SSSI are 1.6km south and 1.5km north of the site respectively. The Ecological Assessment concluded that no impacts on statutory or non statutory wildlife sites are anticipated as a result of the proposed development. As no adverse impacts are anticipated, the construction and operation of the proposed development will not contribute to cumulative impacts on these wildlife sites.

Summary

The environmental assessment process within the ES considers the potential for cumulative impacts to arise as a result of the proposed development in conjunction with other developments within the vicinity of the site.

These assessments have concluded that the proposed development will not cause significant impacts on the local environment in their own right and therefore will not have cumulative impacts when considered in combination with existing and forthcoming developments in the locality.

Otterpool Quarry,
Sellindge, Kent

Proposed Materials Recycling Facility and Anaerobic Digestion Plant

Chapter 10 - Conclusions

September 2009

SLR Ref 409.1376.00002

solutions for today's environment

CONTENTS

10.0 Introduction

10.1 This Environmental Statement (ES) has been prepared in support of the planning application for a Materials Recycling Facility (MRF) and an Anaerobic Digestion (AD) Facility for the recovery of recyclate, energy and compost from waste which would otherwise go to landfill. The application site is a redundant quarry which has been previously used for the storage and maintenance of vehicles and asphalt and concrete production.

10.2 Once operational, the facility will help the relevant local authorities to meet their waste management obligations and targets by diverting waste from landfill and treating it using modern, proven technology.

10.3 The ES has considered the potential environmental impacts and concluded that the site is generally unconstrained by environmental and technical issues.

Main Issues

10.4 The main issues related to the proposed development were considered to be as follows:

- Air quality - ensuring that there are no negative air quality effects from the development;
- Potential landscape and visual impacts;
- Potential increase in traffic on the surrounding road network;
- Potential impacts on the local environment in terms of noise, hydrology and ecology; and
- The potential cumulative impacts associated of the proposed development.

These issues were assessed and concluded as follows;

Air Quality

10.5 An assessment of the air quality impacts associated with the proposed development has been undertaken. This assessment described the impact of the development proposals on the aerial environment and addressed the following issues:

- Release of Air Quality Strategy (AQS) pollutants from vehicles;
- Deposited 'nuisance' dust;
- Suspended particulate matter; and
- Odour.

10.6 Due to the nature of the airborne dust particles (coarse particles) that would

be generated by the proposed development, the on-site activities were not considered likely to result in a detrimental impact on health off-site due to dust emissions. It was considered that the risk of off-site impact (dust nuisance) during construction, operation, and post-closure phases would be negligible.

10.7 Odours may arise during the reception and treatment of waste from the organic fines sludge processing activities, the digesters, and the dewatering process. For this reason the proposal includes designed in mitigation measures, incorporating measures to contain, extract, and treat odorous air in specifically dedicated odour abatement plant (biofilters). These measures are designed to ensure that the potential impact from these sources is reduced to a negligible level.

10.8 Combustion of biogas generated by the AD plant at the site represents best-practice with respect to minimising the emission of gases with global warming potential from anaerobic digestion plants and generating renewable energy. The design and operation of the gas utilisation plant would be regulated by a PPC permit issued by the Environment Agency which would include the specification of emission limits for the gas utilisation equipment in order to minimise the potential of off-site health effects. A full assessment of pollutant emissions associated with the gas plant would be carried out as part of the PPC permit application.

10.9 A Stage 1 screening assessment has been undertaken to investigate the potential air quality risk due to traffic associated with the development on local roads. The Stage 1 screening showed that predicted traffic movements associated with the proposed development were not significant and that they did not require assessment using the Design Manual for Roads and Bridges (DMRB) screening methodology.

10.10 The impact of emissions from the proposed development would not therefore give rise to significant adverse air quality effects for either human or ecological receptors in either the short-term or the long-term.

Landscape and Visual Impact

10.11 The application site is a redundant quarry which has no landscape designations. However, planting and landscaping will be used to reduce views into the site. The existing earth bunds will be retained around the site boundaries as will as much of the existing vegetation as possible.

10.12 Additional planting will provide a greater depth of screening to the site boundary compared with the coniferous hedging which is aligned on the southern boundary. Kent County Council's Landscape officer confirmed that the location of the proposal is suitable in terms of utilising an existing, and derelict, site and that the industrial park to the south sets a precedent for integrating large scale buildings into the landscape within the broader area.

10.13 Within the site, an internal planting area is proposed which will enclose the office building and the recycling facility to prevent glimpsed views from the southern end of Barrow Hill. This will provide a wrap around to the western

edge of the development. A hedgerow is proposed adjacent the main entrance, to screen the lorry parking area from glimpsed views through the main entrance.

10.14 In summary, the visual impact of the proposed development will be significantly reduced by the retention of the soil screening bunds, existing planting and new planting.

Traffic and Transport

10.15 The Transport Assessment assessed the traffic and transport implications of proposals to develop AD and MRF facilities at a disused minerals processing site, located off the A20, Sellindge, Kent. The existing access junction would be upgraded as part of the proposals. The development would receive wastes from East Kent and would generate approximately 152 two-way HGV movements per day, averaging around 16 movements per hour.

10.16 The application site is well located in terms of access to the strategic road network and all HGV traffic, with the exception of very local trips, would be routed east from the site access to access the M20 at Junction 11. The route passes minimal development and avoids the villages of Sellindge and Barrowhill.

10.17 The operation of the proposed access junction has been assessed and has demonstrated that the junction would operate with significant spare capacity in the future situation, with no queuing or driver delay expected. No capacity issues are anticipated on the surrounding highway network.

10.18 The A20 has a high proportion of HGV use and is an established freight route for vehicles travelling between the M20 and Lympne Industrial Estate. The development proposals would generate a moderate increase in HGV numbers on this link, however no significant environmental impact has been concluded.

10.19 An assessment of personal injury road traffic accidents identified no accidents within the immediate vicinity of the site access junction during the previous five years. An insignificant impact upon road safety has been concluded.

10.20 Overall, it is considered that the development proposals are acceptable in traffic and transport terms.

Noise

10.21 A noise assessment was undertaken to assess the potential impact of noise from the operations on the local environment. A BS4142 assessment of noise from the fixed plant has shown that the weekday and weekend operations will lead to a situation of 'complaints unlikely'.

10.22 The ambient noise assessment has shown that, with the recommended mitigation measures, the impact on ambient noise levels will be at worst, slight and barely perceptible.

10.23 Overall it is concluded that with respect to noise, there would be no adverse impact on the surrounding receptors.

Geology Hydrology and Hydrogeology

10.24 The site lies within Flood Zone 1 (low risk) and has less than 0.1% annual probability of flooding each year. The potential impacts of the proposed development upon the hydrogeological and hydrological environments have been identified and assessed, and where appropriate, mitigation measures have been accommodated into the design of the development.

Overall, it is concluded that, with respect to geology, groundwater and surface water, there are no significant residual impacts of the development after consideration of the identified mitigation measures.

Ecology

10.25 The proposed development will not impact upon any statutory and non-statutory designated nature conservation sites within the zone of influence.

10.26 The assessment of impacts has identified that the proposed development would result in the potential disturbance of the badgers resident in a sett in the south eastern corner of the site, but that the level of disturbance is not significant at a local level. No other residual impacts associated with the proposed development are anticipated.

Cumulative Impacts

10.27 No significant adverse cumulative effects have been identified as a result of the proposed development.

Summary

10.28 The South East plan has identified an 'immediate and acute' shortfall in the capacity required to achieve the ambitious targets for recycling, composting and other forms of recovery. The Plan goes on to say that there needs to be a rapid increase in management capacity and that waste planning authorities need to address this shortfall now. The proposed development is in compliance with intentions of the Government and local authorities to promote sustainable waste management. The AD facility and MRF will deliver the infrastructure required to deliver these intentions.

10.29 The conclusions of the Technical Assessments have demonstrated that, subject to identified mitigation measures, the effects of the development are unlikely to be significant. In summary, the proposed development will provide the following benefits;

- Provide a safe, proven and sustainable alternative to landfill for recyclable and compostable waste;
- Offset the economic impact of landfill tax which would otherwise be passed on to local tax payers;
- Generate green electricity to power site operations and be supplied to the National Grid;
- Involve the redevelopment of previously used land; and
- Provide temporary and permanent employment during construction and operation.